CONTENTS

TRADE NAME	MODEL	SET AND FOLDER NO.
Airline	35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A Tel. Rec.	221-2
Arvin	758T (Ch. RE350)	221-3
Coronado	35RA4-43-9856A	221-4
Crosley	EU-21CDBU, EU-21CDMU, EU-21CDNU, EU-21COBUa, EU-21COMUa (Ch. 390 & UHF Ch. 391) Tel. Rec., Prod. Chg. Bul. 80	221-1
Hallicrafters	TW-1000 (Run 1)	221-5
Hoffman	21B907, 21M906, 21P908 Tel. Rec.	221-6
Majestic	21P62, 21P63 (Series 110, 111) Tel. Rec.	221-7
Motorola	503	221-8
Silvertone	3040 (Ch. 528.253)	221-9
Sonora	421, 422, 423, 424, 425, 426, 428, 429 Tel. Rec.	221-10
Sylvania	513 Series (Ch. 1-601-2), 563B (Ch. 1-601-3)	221-11
Truetone	3D6000 UHF Conv.	221-12
Webcor	181-1R	221-13
Zenith	L403F, G, R, Y (Ch. 4L41)	221-14

PROPERTY OF
L. F. BLANKENSHIP
3931 MEADE ST.
DENVER COLORADO

SUPPLEMENTAL DATA TO PHOTOFACT FOLDERS IN SET 186

Ch. 390, 391

Crosley Models EU-21CDBU, EU-21CDMU, EU-21CDNU, EU-21COBUa and EU-21COMUa (Ch. 390 and UHF Ch. 391) are identical to the Models covered in Photofact Folder 3, Set 186 except a UHF converter is built in the set. This converter is mounted on a shelf in the bottom of the cabinet. The tuning control of the converter is operated by a sprocket and chain system and the function switch is operated by an arm and linkage system. The drawing in Fig. 1 below shows the position of the converter in the cabinet and the connections to the main chassis. The drawing in Fig. 2 shows the Front Control Panel with the new controls. A schematic, alignment instructions and dial stringing guide for the converter are also included in this Production Change Bulletin.

The following disassembly instructions should be used in lieu of the ones given on page 10 in Photofact Set 186-3.

VHF CHASSIS REMOVAL

1. Remove 4 push on type control knobs and VHF-UHF selector knob from front panel.
2. Remove 4 wood screws, remove rear cover.
3. Disconnect speaker.
4. Disconnect AC power cord from UHF converter.
5. Remove twin lead from antenna terminals board.
6. Remove 4 chassis bolts.
7. Loosen 2 wood screws on left side of converter shelf.
8. Lift up converter shelf enough to remove drive chain from sprocket on converter.
9. Slide VHF chassis to rear slightly and remove function switch hub from contrast control shaft.
10. Remove chassis from cabinet, being careful that UHF drive chain clears hole.

UHF CONVERTER REMOVAL

1. Turn UHF tuning control to one extreme of its rotation.
2. Disconnect AC power cord from converter.
3. Disconnect 3 twin leads from terminal boards on UHF converter.
4. Remove cotter-pin that holds the vertical coupling rod to the toggle plate and remove rod.
5. Remove 4 wood screws holding converter shelf to cabinet.
6. Lift left side of converter shelf and remove drive chain from sprocket on converter.
7. Slide converter shelf back until clear of speaker and lift out.

NOTE: When replacing chassis care should be taken with the two screws on the left side of the converter shelf. The two screws should be tightened evenly with chain loose enough to permit smooth operation without backlash. If screws are tightened too tight undue strain will be placed on converter shaft. Also, the UHF tuner shaft and the control knob should be maintained in the same position as when removed.

CROSLEY MODELS EU-21CDBU, EU-21CDMU, EU-21CDNU, EU-21COBUa, EU-21COMUa (Ch. 390 & UHF Ch. 391)

(Continued on the Reverse Side)

PRODUCTION CHANGES
BULLETIN 80

PRODUCTION CHANGES
BULLETIN 80

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

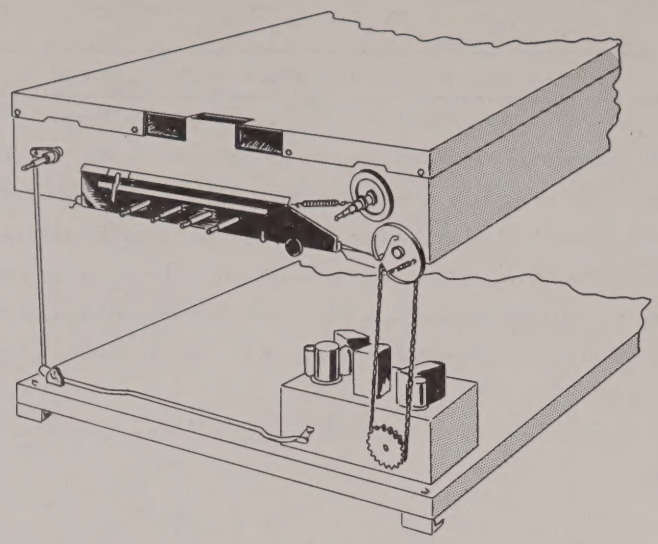


FIG. 1

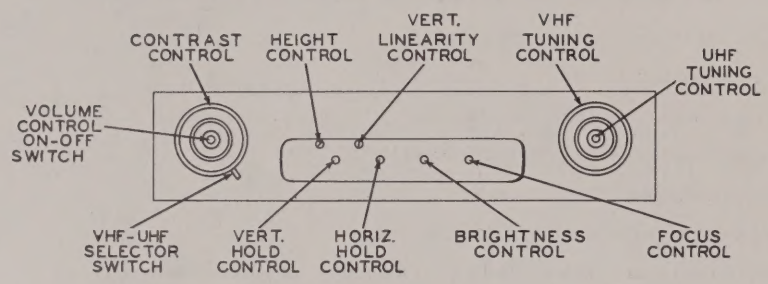
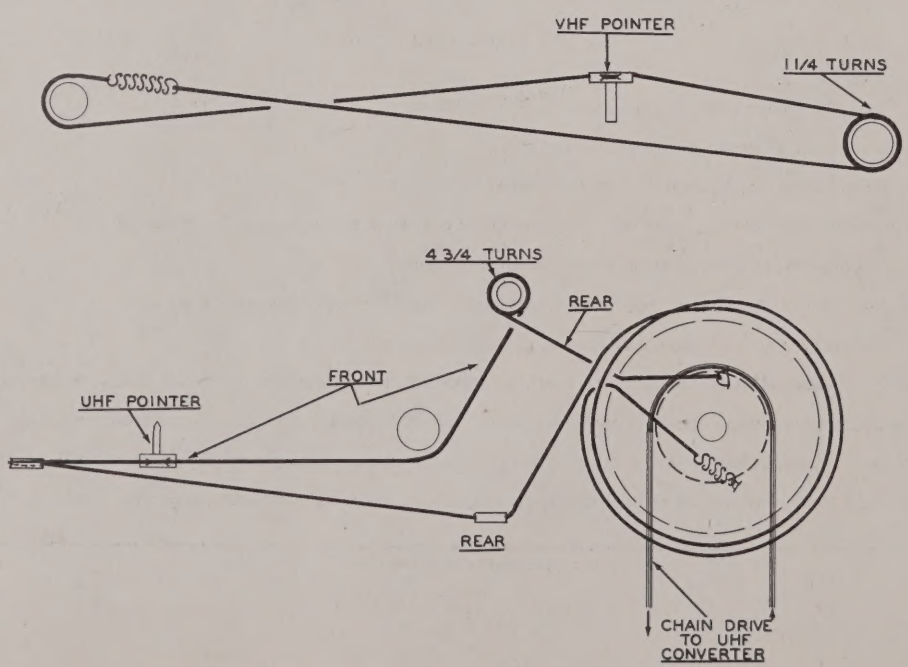
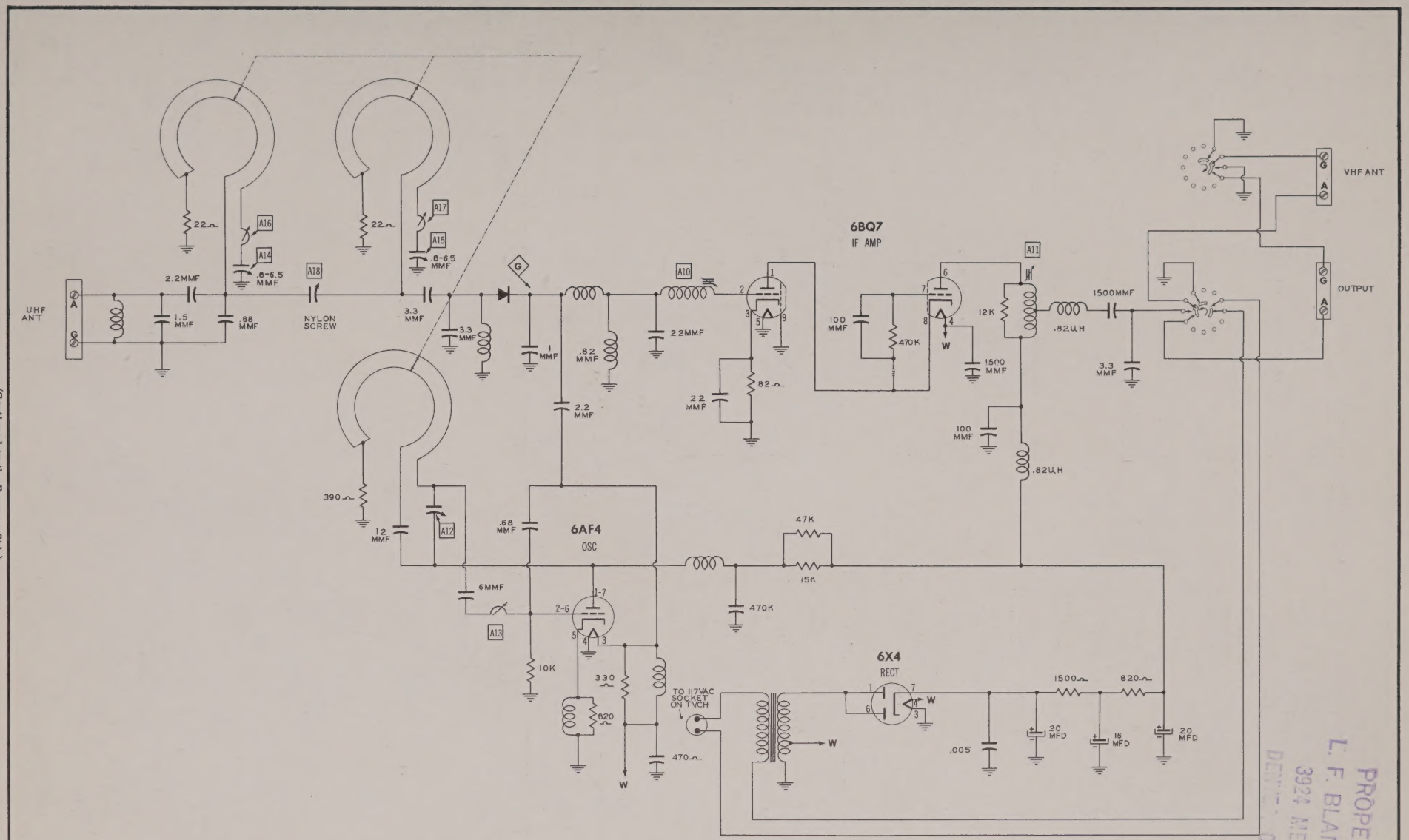


FIG. 2



DRIVE CORD STRINGING

(Continued on the Next Page)



CROSLEY MODELS EU-21CDBU, EU-21CDMU, EU-21CDNU, EU-21COBUa, EU-21COMUa (Ch. 390 & UHF Ch. 391)

(Continued on the Reverse Side)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CONVERTER ALIGNMENT

Remove converter from the cabinet.
Turn function switch to UHF position.
All leads should be kept as short as possible.

IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 3	Thru matching network to point Ⓖ.	127MC (AM Mod.)	Rotate tuning shaft to maximum counter clockwise position.	Thru detector probe (Fig. 4) to converter output terminals.	A10	Adjust for maximum deflection on scope.
2.	"	"	"	"	"	A11	Adjust for maximum deflection. Repeat steps 1 and 2.

OSCILLATOR ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Fig. 3	Thru antenna matching network to UHF antenna terminals.	465MC (AM Mod.)	Rotate tuning shaft to max. counter clockwise position.	Thru detector probe (Fig. 4) to converter output terminals.	A12	Adjust for maximum deflection on scope.
4.	"	"	902MC (AM Mod.)	Rotate tuning shaft to maximum clockwise position.	"	A13	Adjust for maximum deflection. Repeat steps 3 and 4 until no improvement is noted.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Fig. 3	Thru antenna matching network to UHF antenna terminals.	467MC (AM Mod.)	Rotate tuning shaft to maximum counter clockwise position	Thru detector probe (Fig. 4) to converter to output terminals.	A14, A15	Adjust for maximum deflection on scope.
6.	"	"	904MC (AM Mod.)	Rotate tuning shaft to maximum clockwise position.	"	A16, A17	Adjust for maximum deflection. Repeat steps 5 and 6 until no improvement is noted.
7.	"	"	467MC (AM Mod.)	Rotate tuning shaft to maximum counter clockwise position.	"	A18	Adjust for maximum deflection.

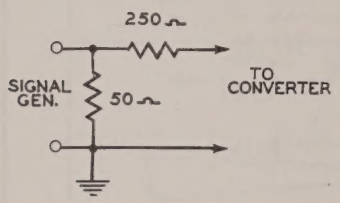


FIG 3

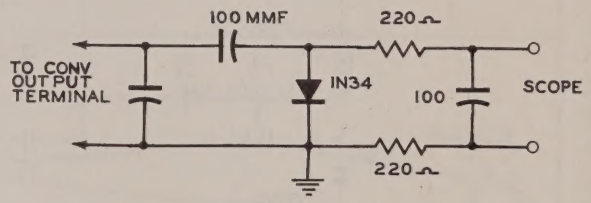


FIG 4

PHOTOFACT* Folder

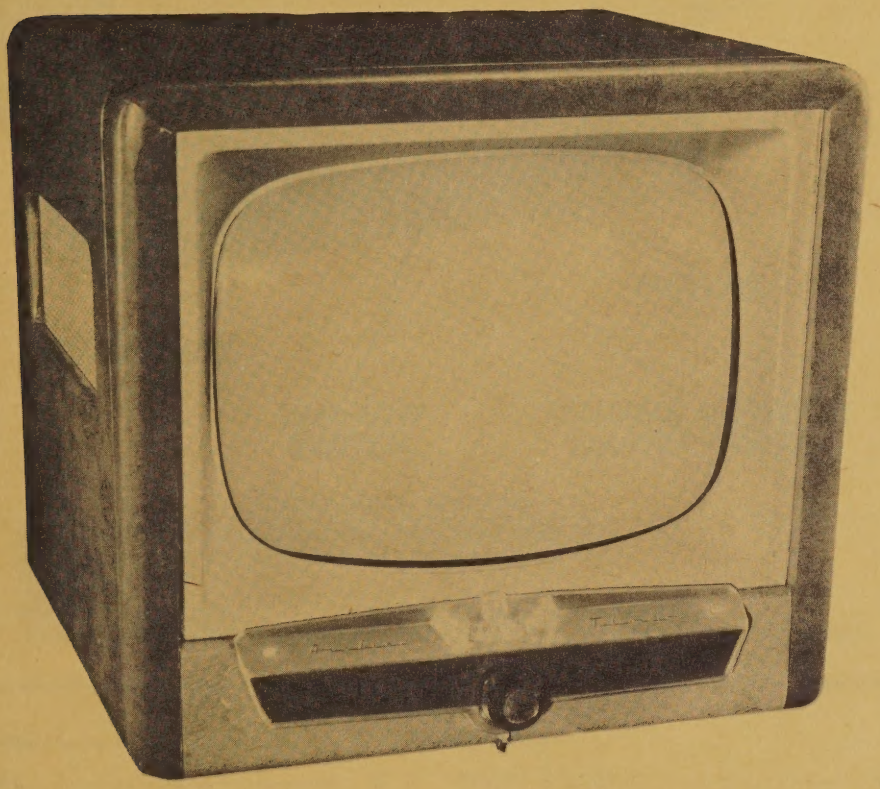
AIRLINE MODELS 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 35BR-3158

AIRLINE MODELS 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

*"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."

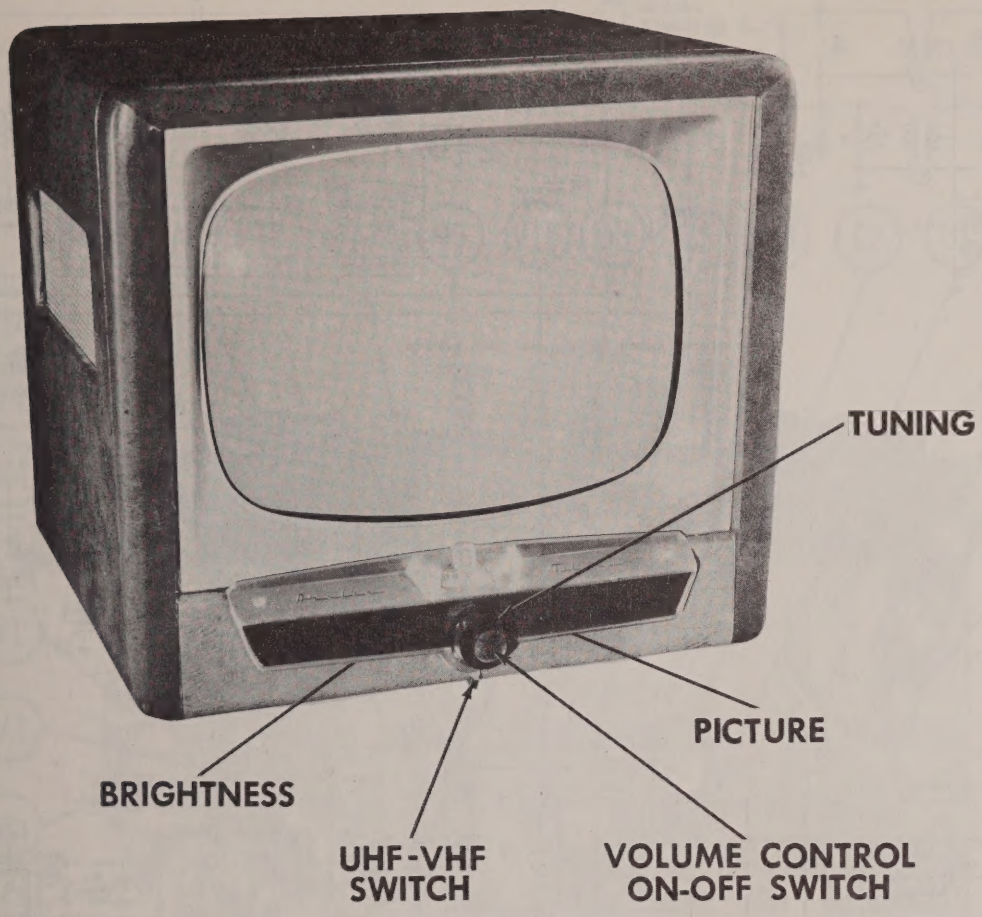
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 11-53 SET 221 FOLDER 2

PHOTOFACT* Folder
*TRADE MARK

AIRLINE MODELS 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



AIRLINE MODELS 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A

AIRLINE MODEL 35BR-3158A

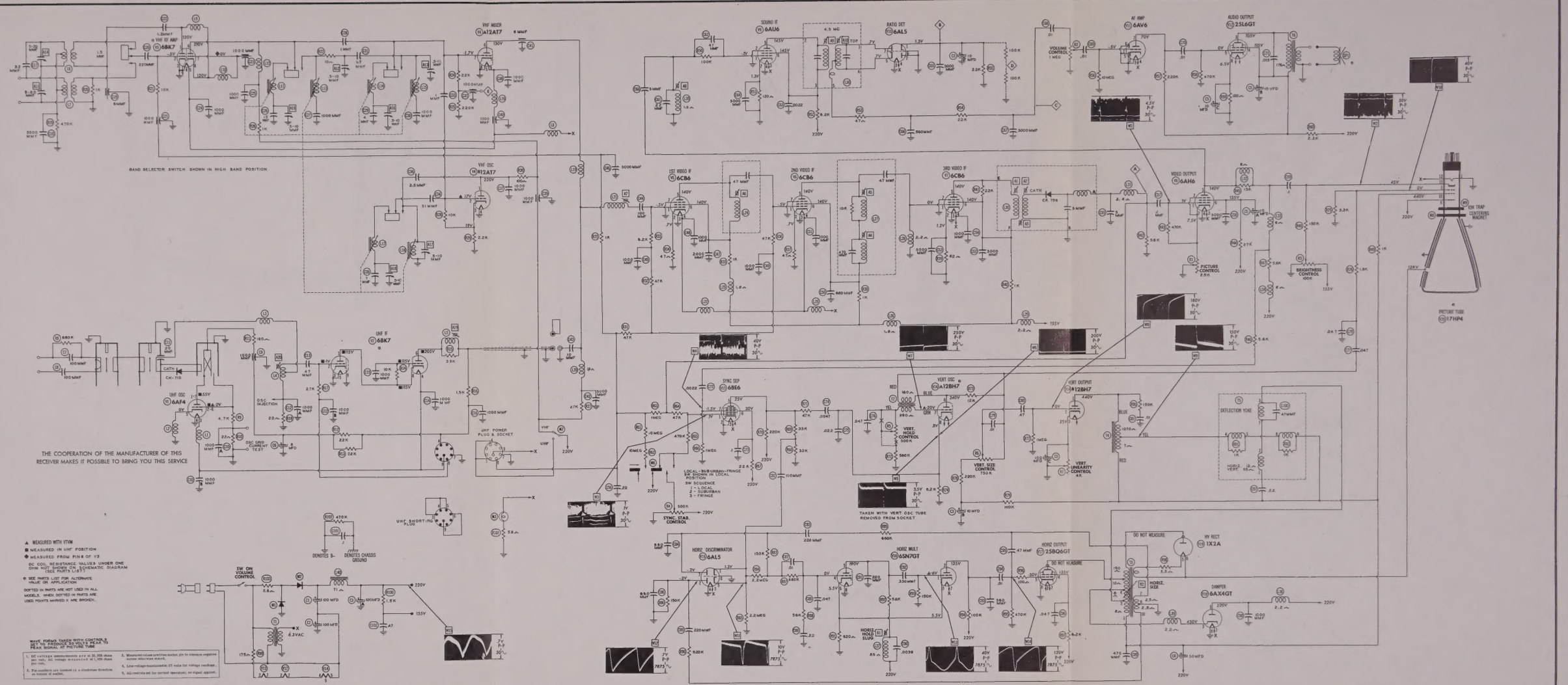
TRADE NAME	Airline Models 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-115 Volts AC-60 Cycle RATING 1.7 Amp. @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 26.75MC, Sound IF 22.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Drive Cord Stringing 10
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 10
Parts List and Descriptions 14, 15, 16
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 11
Photographs (Cont)
Resistor Identification 19, 20
Trans., Inductor and Alignment Identification 13
Resistance Measurements 8
Servicing in the Field 18
Schematic 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

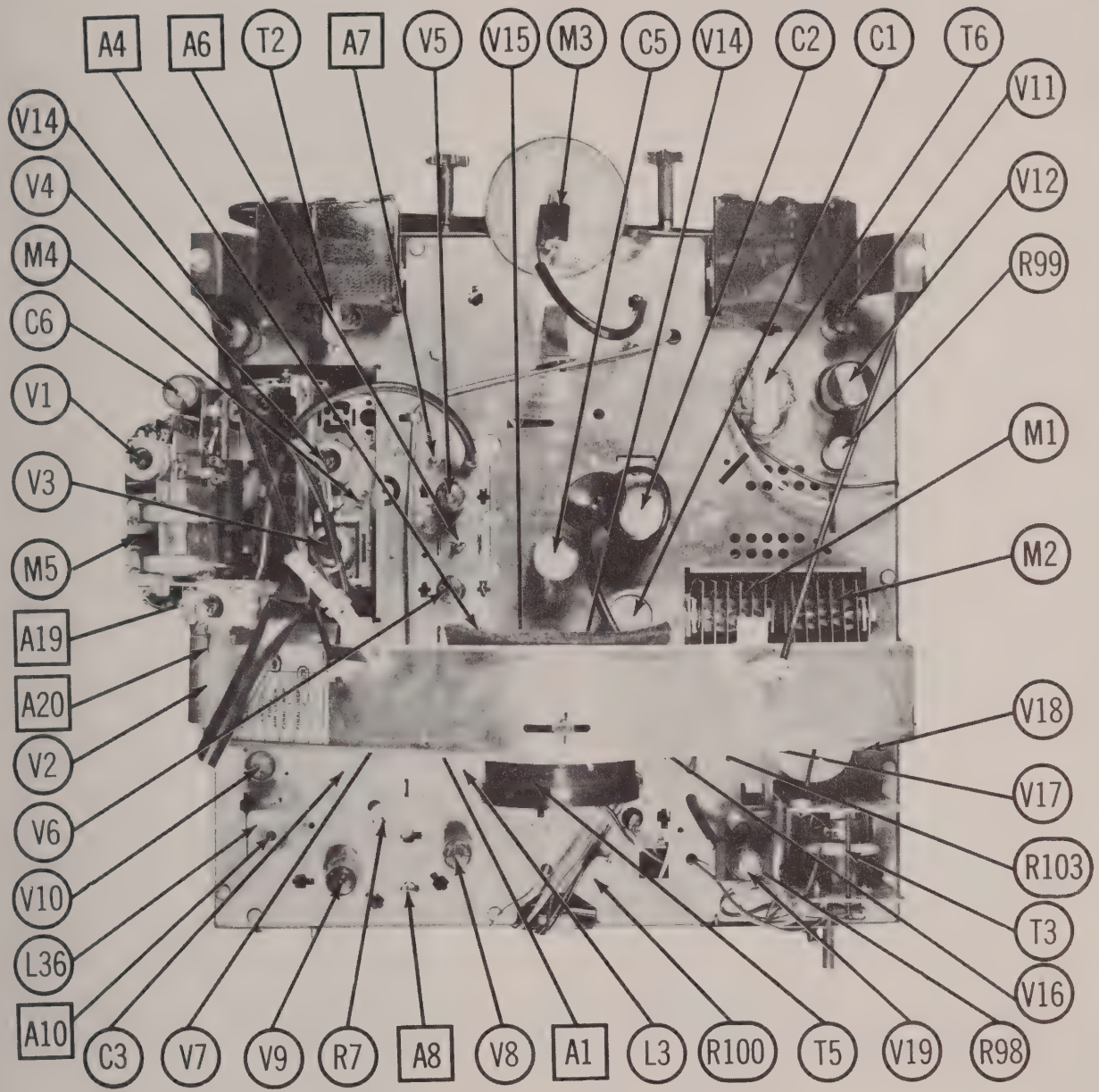

VHF MIXER V8 A12AT7
VHF OSC V9 12AT7
VHF V6 6BK7
SOUND IF V5 6AU6
RATIO DET V10 6AL5
AF AMP V11 6AV6
AUDIO OUTPUT V12 25L6GT
1ST VIDEO IF V5 6CB6
2ND VIDEO IF V6 6CB6
3RD VIDEO IF V7 6CB6
VIDEO OUTPUT V8 6AH6
PICTURE TUBE V20 17HP4
ION TRAP CENTERING MAGNET
UHF OSC V1 6AF4
UHF IF V2 6BK7
SYNC SEP V11 6BE6
VERT OSC V14 A12BH7
VERT OUTPUT V13 A12BH7
HORIZ DISCRIMINATOR V13 6AL5
HORIZ MULT V14 6SN7GT
HORIZ OUTPUT V17 25BQ6GT
HV RECT V18 1X2A
DAMPER V16 6AX4GT
BAND SELECTOR SWITCH SHOWN IN HIGH BAND POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
LOCAL-SUBURBAN-FRINGE SW SHOWN IN LOCAL POSITION
SW SEQUENCE 1 - LOCAL 2 - SUBURBAN 3 - FRINGE
TAKEN WITH VERT OSC TUBE REMOVED FROM SOCKET
DO NOT MEASURE
SW ON VOLUME CONTROL
DENOTES B-
DENOTES CHASSIS GROUND
UHF SHORTING PLUG
UHF POWER PLUG & SOCKET
DEFLECTION YOKE
VOLUME CONTROL 1 MEG
PICTURE CONTROL 2.5K
BRIGHTNESS CONTROL 100K
VERT. HOLD CONTROL 500K
VERT. SIZE CONTROL 750K
VERT. LINEARITY CONTROL 4K
HORIZ. HOLD SLUG
HORIZ. SIZE
SYNC. STAB. CONTROL 500K
OSC GRID CURRENT TO TEST
OSC INJECTION
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 20 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
▲ MEASURED WITH VTVM
■ MEASURED IN UHF POSITION
◆ MEASURED FROM PIN 8 OF V3
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM (SEE PARTS LIST)
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to chassis unless otherwise stated.
4. Line voltage measured at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1953

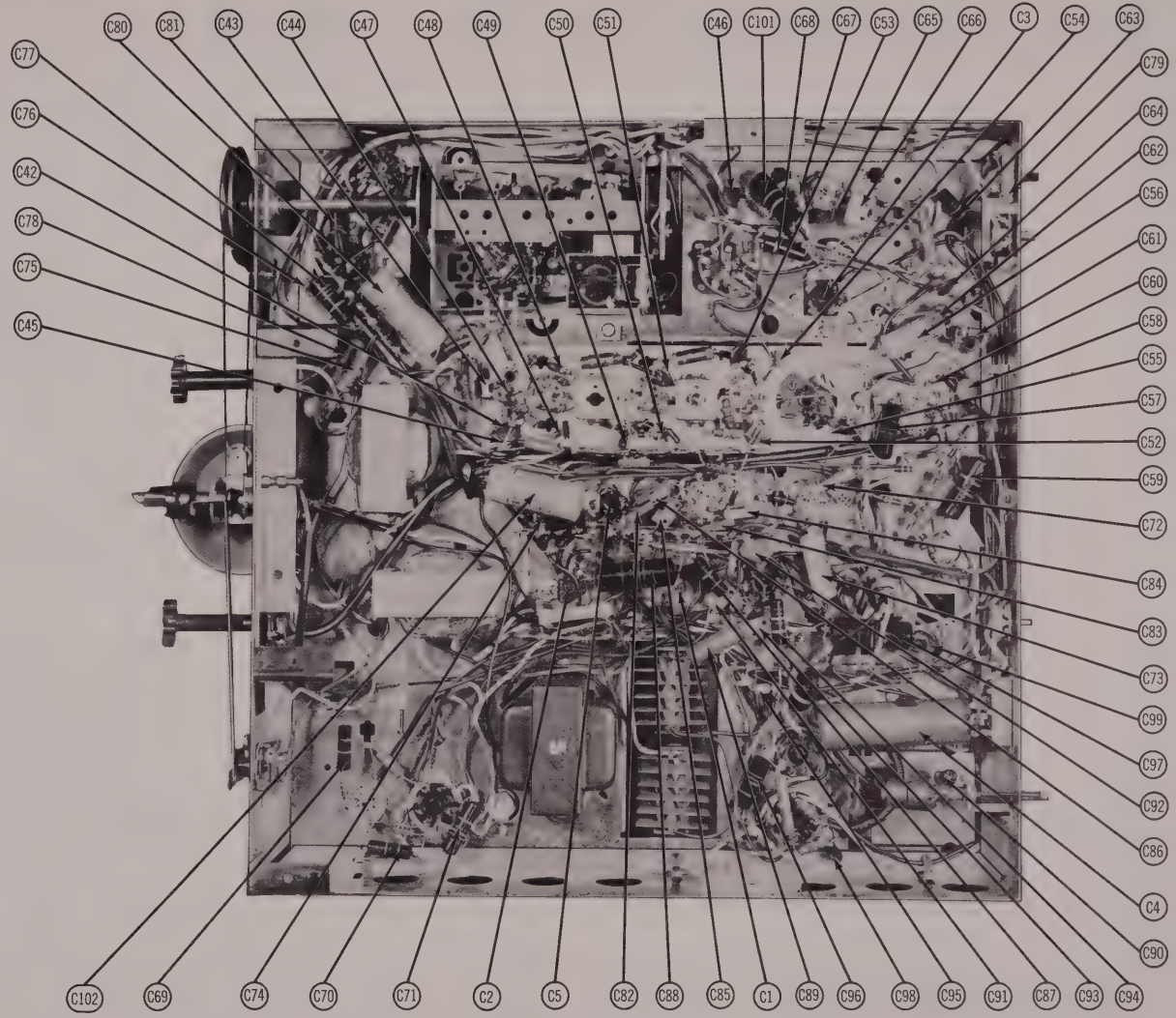
AIRLINE MODELS 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A

AIRLINE
MODELS 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A



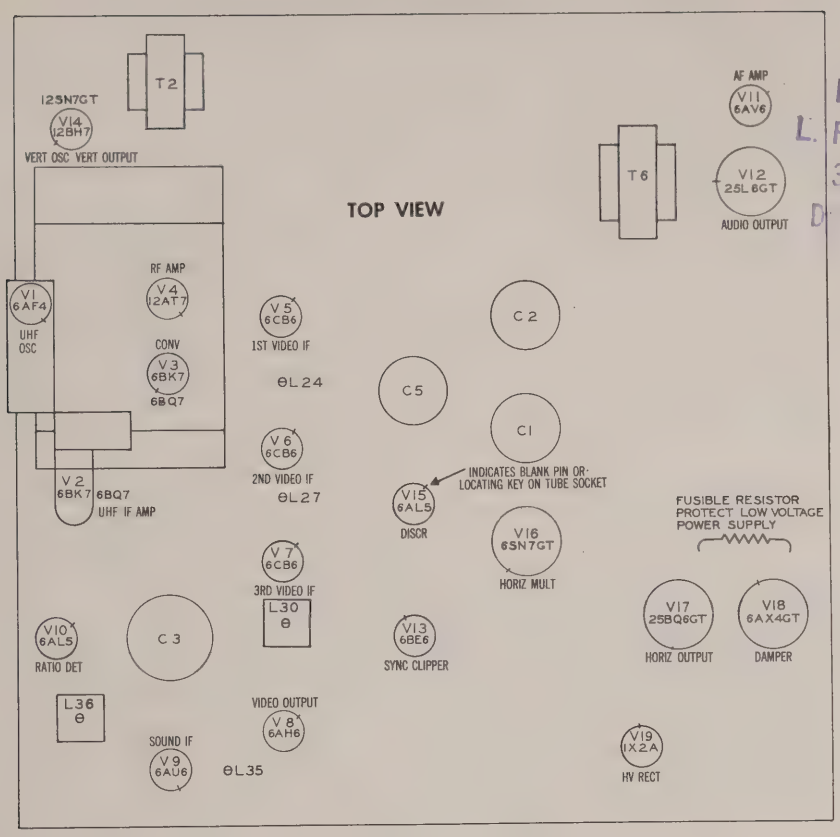
CHASSIS TOP VIEW

SET 221 FOLDER 2



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



PROPERTY OF
L. F. BLANKENSHIP

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, V7, V8 (V1 UHF only)
No pic, no sound, has snow - V3, V4, V5
No pic, has sound, has raster - V8, V20
Has pic, no sound - V9, V10, V11, V12

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V15, V16
No vert. or horiz. sync - V13

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V20
No vertical deflection - V14
Poor vert. linearity or foldover - V14
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, M1, M2
Vert. off freq. - V13, V14
Horiz. off freq. - V13, V15, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

CAUTION: Use an isolation transformer when aligning this receiver to prevent shock hazard from the top chassis and possible damage to test equipment.
The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage. Chassis refers to Chassis Top Plate.

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the Fringe-Local-Suburban switch to "Fringe" position.
A very short lead from the generator to the converter grid is necessary to prevent regenerations.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V7). Low side to chassis.	25MC (10MC Swp)	23.5MC 26.2MC	13	Vert. Amp. to point (A). Low side to chassis.	A1, A2, A3	Connect short between pins 5 and 6 of V6. Adjust generator for 1 volt peak to peak on scope. Adjust A1, A2 and A3 for response as in Fig. 1. A3 is an adjustable coupling rod on bottom of L30.
2.	"	High side to point (E). Low side to chassis.	Not used	21.4MC	"	Use VTVM. DC probe to point A. Common to chassis.	A4	Remove short from pins 5 and 6 of V6. Attenuate generator to maintain 2 volts at VTVM. Adjust A4 for maximum deflection.
3.	"	"	"	26.5MC	"	"	A5	Adjust for maximum deflection.
4.	"	"	"	21.4MC	"	"	A4	"
5.	"	"	"	23.8MC	"	"	A6	"
6.	"	"	"	25.0MC	"	"	A7	"
7.	"	"	25MC (10MC Swp)	23.5MC 26.75MC	"	Vert. Amp. of scope to point (A). Low side to chassis.	A1	Adjust A1 for flat-top response curve as in Fig. 2. If response is not as shown, repeat the alignment procedure.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning until sound bars just appear in the picture. Starting from extreme counter clockwise position adjust A8 in a clockwise direction for minimum sound indication in picture.
Do not adjust for maximum sound from speaker.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to B-. The junction of these two resistors is alignment point (D) as shown on the schematic.
Short the antenna terminals to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A9	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (C). Common to point (D).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Short antenna terminals to chassis.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A9	Disconnect stabilizer capacitor C3D. Adjust for curve of maximum amplitude and symmetry as in Fig. 3.
9.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A10	Reconnect capacitor C3D. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

TUNER ALIGNMENT

Preset the trimmer screws as shown in Fig. 5. Turn the tuning control to the top of its stroke in low band position.
Adjust coil cores so that bottoms of cores are 1.6 inches above bottoms of coil forms.
Connect a .001MFD capacitor across scope input terminals and 10KΩ in series with hot lead of scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

LOW BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point (E). Low side to chassis.	A11, A12, A13	Adjust for maximum response as in Fig. 6.
11.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5			Check for response similar to Fig. 6. If necessary retouch A12 and A13 for nearest approach to Fig. 6 on all low band channels.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (cont)

HIGH BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (E). Low side to chassis.	A14, A15 A16	Adjust for maximum response as in Fig.6.
13.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for response similar to Fig.6. If necessary retouch A15 and A16 for nearest approach to Fig.6. response on all high band channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			

OSCILLATOR ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC Swp)	83.25MC	6	Vert. Amp. to point (A). Low side to chassis.	A17	Adjust to place video marker at 50% on low frequency slope of response as in Fig. 7.
15.	"	"	69MC (10MC Swp)	67.25MC	4	"		Check for marker placement as in Fig.7. If necessary make SLIGHT compromise adjustment of A17 for best marker placement across low band channels.
			57MC (10MC Swp)	55.25MC	2			
16.	"	"	213MC (10MC Swp)	211.25MC	13	"	A18	Adjust to place video marker at 50% on low frequency slope as in Fig.7.
17.	"	"	195MC (10MC Swp)	193.25MC	10	"		Check for marker placement as in Fig.7. If necessary make slight compromise. Adjustment of A18 for best marker placement across high band channels.
			177MC (10MC Swp)	175.25MC	7			

UHF TUNER ALIGNMENT

The cascode pre-IF amplifier can be aligned if necessary, by connecting a 25MC unmodulated signal to the junction of C11 and L4 and the DC probe of a VTVM to point (A). Adjust A19 and A20 for maximum deflection on VTVM.
In the event of dial cord replacement or component replacement, the RF cavities may be adjusted for peak performance. Tune to a UHF program, loosen the pully positioning screw (Fig.8) and rotate the RF drive pulleys for best picture. Tighten the positioning screw.
Complete realignment of the UHF tuner involves the use of precision UHF test equipment and should not be attempted in the field.

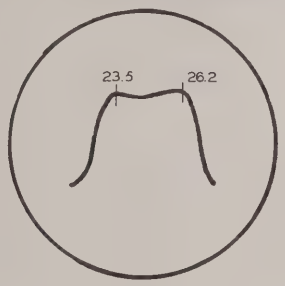


FIG.1

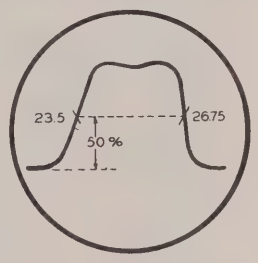


FIG.2

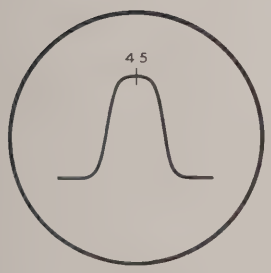


FIG.3

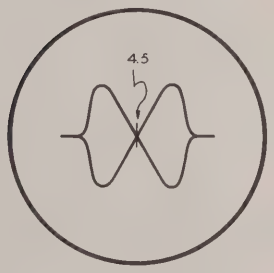


FIG.4

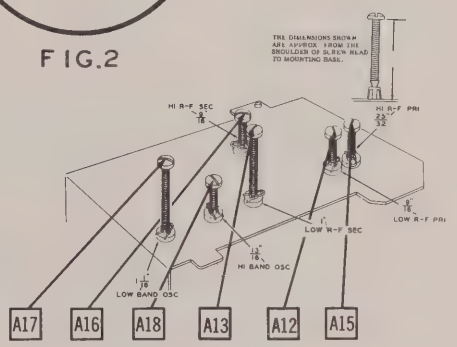


FIG. 5

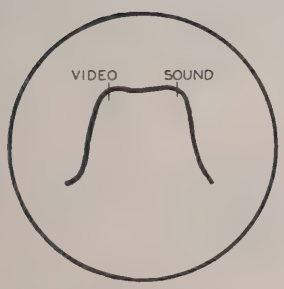


FIG. 6

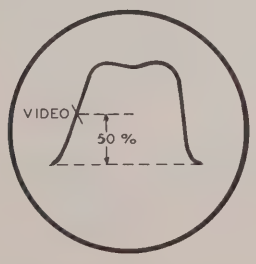


FIG.7

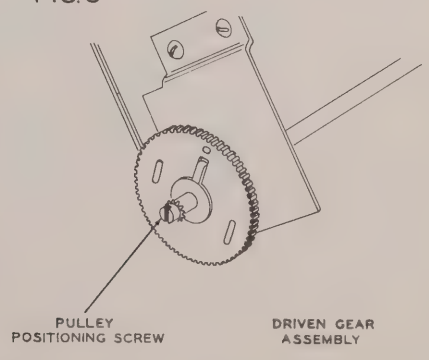
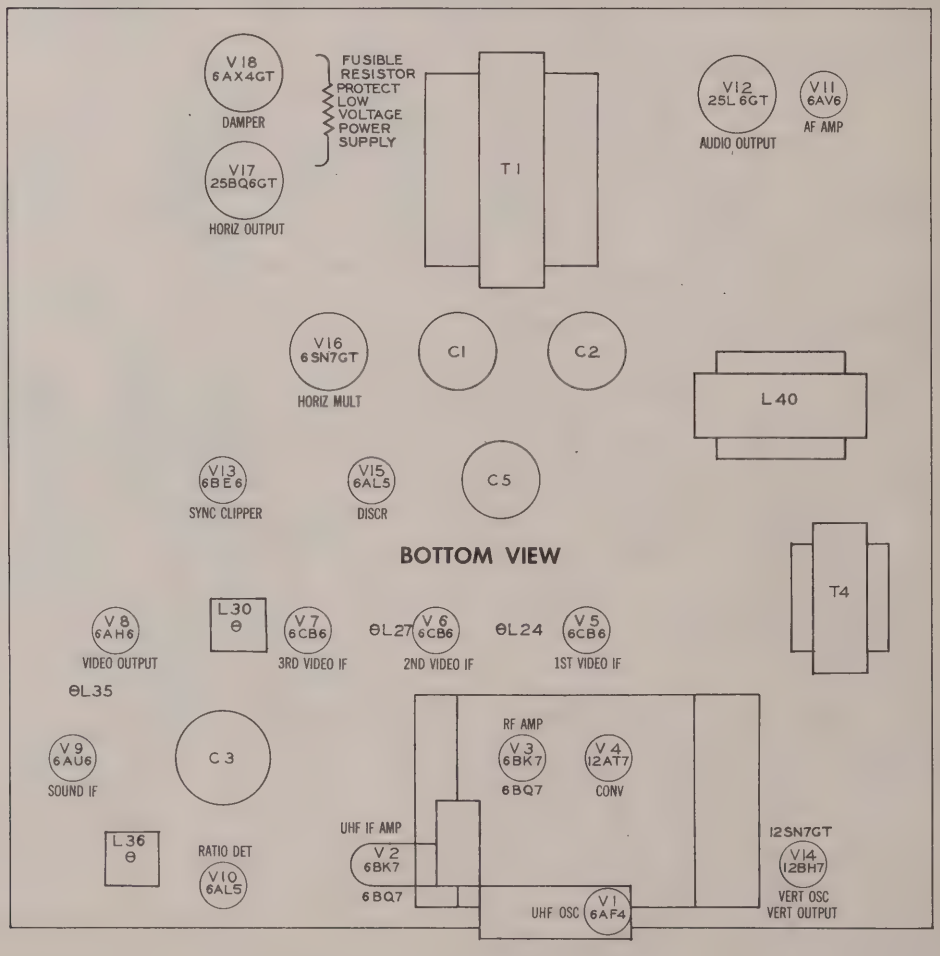


FIG. 8

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■†11KΩ	4.7KΩ	.2Ω	0Ω	0Ω	4.7KΩ	■†11KΩ		
V 2	6BK7	INF	1Meg	0Ω	.1Ω	0Ω	■†1.5KΩ	INF	INF	0Ω
V 3	6BK7	INF	1Meg	0Ω	0Ω	.2Ω	†1KΩ	INF	INF	0Ω
V 4	12AT7	†170Ω	12KΩ	2.2KΩ	0Ω	0Ω	†27KΩ	240KΩ	0Ω	.2Ω
V 5	6CB6	1Meg	47Ω	0Ω	.3Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 6	6CB6	1Meg	47Ω	0Ω	.2Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 7	6CB6	2.2Ω	82Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 8	6AH6	470KΩ	225Ω	.1Ω	0Ω	†5.6KΩ	†27KΩ	225Ω		
V 9	6AU6	100KΩ	0Ω	.1Ω	0Ω	†8.2KΩ	†8.2KΩ	120Ω		
V 10	6AL5	22KΩ	0Ω	.1Ω	0Ω	INF	0Ω	INF		
V 11	6AV6	10 Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†220KΩ		
V 12	25L6GT	INF	‡ 30Ω	†2.4KΩ	†2.2KΩ	470KΩ	INF	‡23Ω	120Ω	
V 13	6BE6	50KΩ	0Ω	0Ω	.1Ω	†60KΩ	†22KΩ	1Meg		
V 14	12BH7	♦1KΩ	1Meg	2.2KΩ	‡ 15Ω	‡8Ω	♦1Meg	800KΩ	8.2KΩ	†12Ω
V 15	6AL5	2.2Meg	150KΩ	.1Ω	0Ω	2.2Meg	0Ω	4.5Meg		
V 16	6SN7GT	150KΩ	†100KΩ	820Ω	5Meg	†5.7KΩ	820Ω	.1Ω	0Ω	
V 17	25BQ6GT	INF	♦23Ω	INF	†8.2KΩ	470KΩ	INF	‡15Ω	0Ω	TOP CAP ♦12Ω
V 18	6AX4GT	INF	♦2Ω	200KΩ	2.5Ω	†73Ω	†70Ω	.1Ω	0Ω	
V 19	1X2A			PINS	1 - 9	HAVE	INF RESISTANCE			TOP CAP ♦200Ω
V 20	17HP4	0Ω	3.3KΩ	PIN 6 †70Ω	PIN 10 ♦1KΩ	PIN 11 155KΩ	PIN 12 .1Ω			

ALL READINGS TAKEN IN VHF POSITION UNLESS OTHERWISE NOTED
■ MEASURED WITH VHF-UHF SWITCH IN UHF
† MEASURED FROM OUTPUT OF M2
♦ MEASURED FROM PIN 3 OF V18
‡ MEASURED FROM COLD SIDE OF ON/OFF SWITCH



TUBE PLACEMENT CHART

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the contrast control for normal contrast.

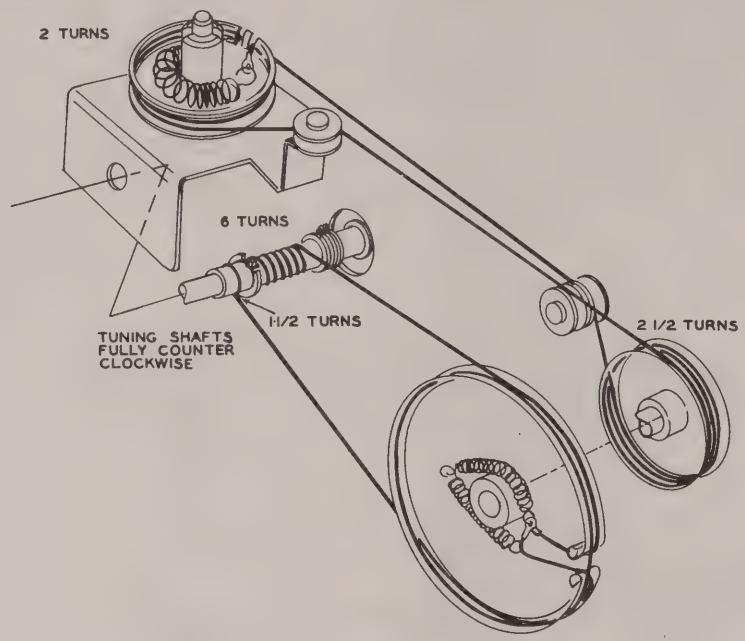
Turn the horizontal hold thumb screw clockwise until it reaches its stop, then counter clockwise two full turns.

The thumb screw is a vernier adjustment and should then be in the center of its range.

Adjust the horizontal hold slug, B1, until the picture synchronizes horizontally and make any further adjustment of B1 necessary to set it in the middle of its range of synchronization.

Adjust the horizontal size (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

DIAL CORD STRINGING



UHF DRIVE CORD STRINGING

If for any reason the drive cord of either the RF or oscillator cavities need replacement, the exact cord and length are recommended. The cord used is of a special material which is not affected by temperature or moisture. Refer to the parts list for the correct replacement. The oscillator drive assembly consists of four (4) separate drive cords each locked to the oscillator drive pulley(Fig. 1) Each RF drive assembly consists of two (2) separate drive cords which are locked to the RF cavity drive pulley (Fig. 2) If the drive cord requires replacement, the picture tube should be removed along with the cavity cover. Follow the diagram and replace the cord as indicated. After replacement follow the instruction for realignment on page 7.

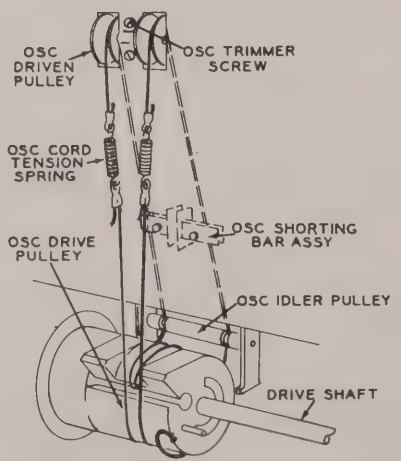


FIG. 1

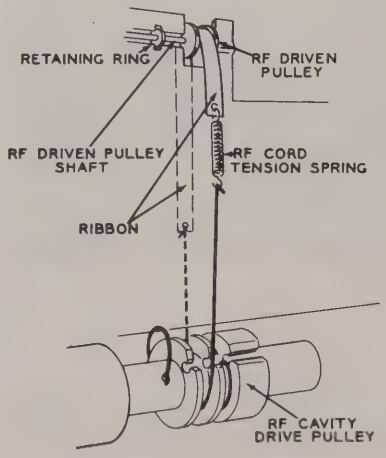
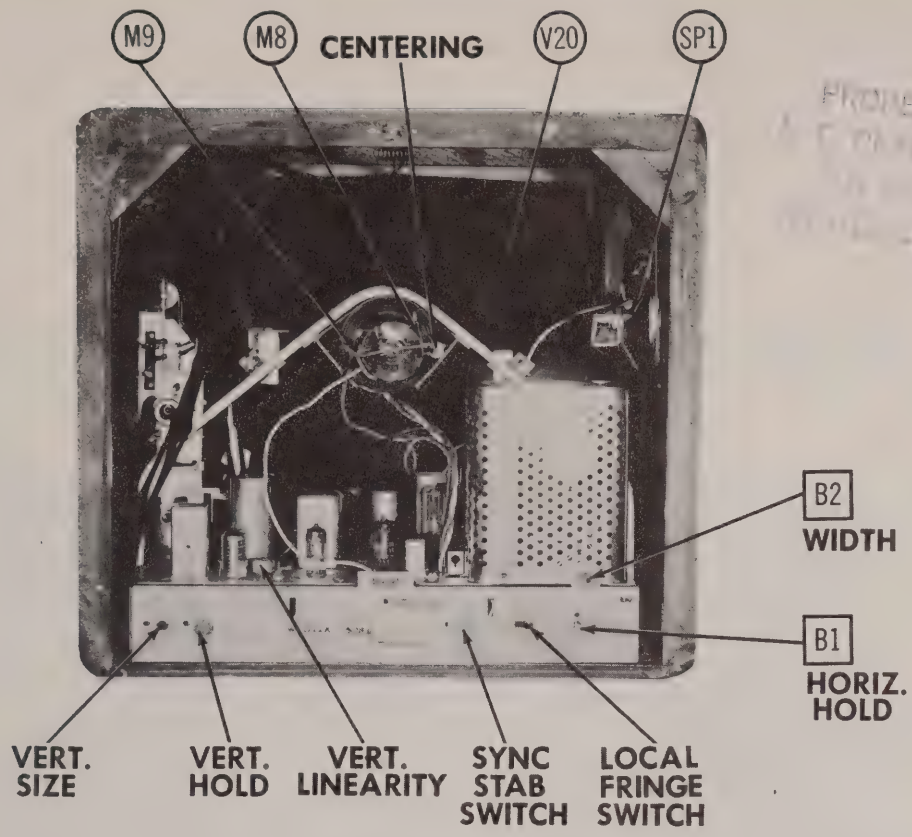
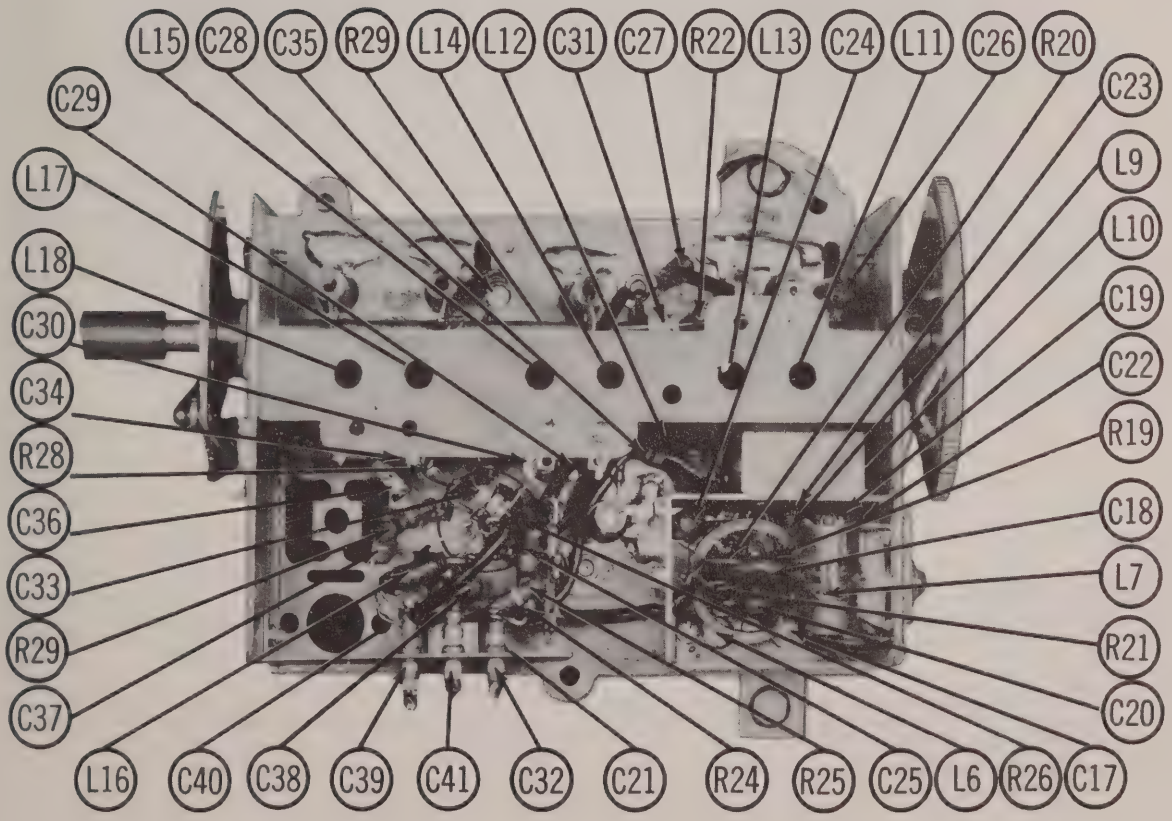


FIG. 2



CABINET-REAR VIEW



RF TUNER-BOTTOM VIEW

TROUBLE SHOOTING AIDS

CAUTION

The top chassis plate, during operation, is at 125 V DC potential and may also be at the line voltage potential depending on how the line cord is inserted.

To avoid shock hazard and/or damage to the receiver and/or test equipment, use an isolation transformer between the line cord and power receptacle on the receiver.

To prevent overloading of circuits and possible component failure, remove AC power before attempting tube substitution in this receiver.

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V16, V17 and V18. Check adjustment of horiz. size (B2). Check waveform at W14 for proper waveform and P to P voltage.

If Satisfactory	If Unsatisfactory
Check C96, C97, C98, C99, C4, T3, T5A and other associated components.	Check C93, C94, C95, C91, C92, R93, R94, R95, M1, M2 and other associated components.

DRIVE LINES

Check by substitution V16, V17 and V18. Check C4, T3, T5A, C93, C94, C95 and other associated components.

COMPRESSED LEFT SIDE

Check adjustment of horiz. linearity magnet and horiz. size. Check by substitution V17 and V18. Check C93, C94, C4, T3, T5A and L38.

FOLDS

Check by substitution V16, V17 and V18. Check T3, T5A, C4, C96, C97, C98, C99, C93, C94, C95 and other assoicated circuit components.

XMAS TREE EFFECT

Substitute V16. Check L37, C90, C91, C92 and other assoicated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V14. Check waveform at W8.

If Satisfactory	If Unsatisfactory
Check T4 and T5B. Check C81 and R80.	Check T2, R78, R79, C79, C80 and other associated components.

INSUFFICIENT SWEEP

Substitute V14. Check adjustment of vertical linearity and vert. size controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V14. Check C79, C80, C3B, R77 and other associated components.

COMPRESSED AT TOP

Substitute V14. Check C3C, T4, T5B and other associated components.

FOLDS

Substitute V14. Check T4, T5B, C3C, C79, C80, R77 and other associated components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V15 and V16. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check C82, R68 and R69. Check components associated with V13 and V15.	Check C83, C84, C85, C86, R89, R90, T3 and other assoicated components.

CRITICAL HOLD

Check setting of Local, Suburban, Fringe switch and sync stabilizer control. Check by substitution V15 and V16. Check components associated with V16, especially the AFC filter network.

VERTICAL

LOSS OF SYNC

Check by substitution V13 and V14. Check waveform W5.

If Satisfactory	In Unsatisfactory
Check components assoicated with V14 especially T2, C76 and R72.	Check C74, C75, R70, R71 and other components associated with V13.

CRITICAL HOLD

Check setting of LSF switch and Sync stabilizer control. Check by substitution V13 and V14. Proceed as outlined under "Loss of Sync".

VIDEO

LOSS OF VIDEO

Check C59, R48, brightness control, picture tube and other associated components.

SOUND BARS (4.5 MC BEAT)

Check setting of Local oscillator in RF tuner. Check adjust of Sound take off trap (A8). Check video IF alignment.

NEGATIVE PIX

Substitute V8. Check video detector crystal and assembly. Check associated components especially all coupling and bypass capacitors. Check video IF tubes and associated components. Check picture tube.

POOR CONTRAST

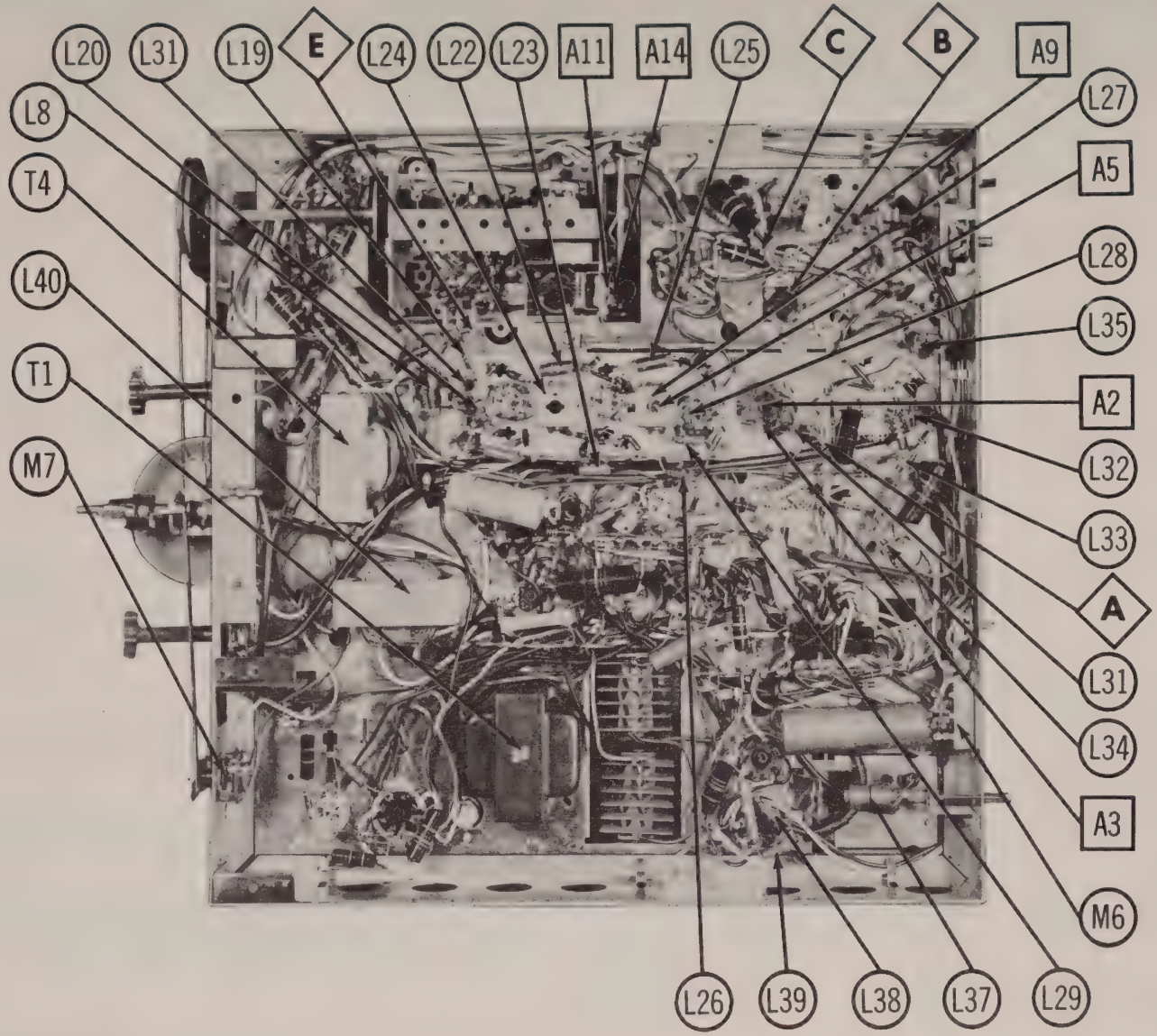
Substitute V8. Check video detector crystal and assembly. Check video IF tubes and alignment.

SMEAR OR WASHED OUT PIX

Check setting of Local, Suburban, Fringe switch. Substitute V8. Check video detector crystal and assembly. Check C57, C58, C59, C5A, R43, R47, L32 picture tube and other associated circuit components.

ONE WIDE BLACK BAR ACROSS PIX

Check RF tuner, video IF and video amplifier tubes for heater to cathode leakage.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

MODELS 35BR-3158A, 35BR-3167A, 35BR-3168A, 35BR-3169A

AIRLINE

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIR LINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	UHF IF Amplifier	6BK7	6BK7	9AJ	Replace with original type tube only
B	UHF IF Amplifier	6BQ7A	6BQ7A	9AJ	
V3A	RF Amplifier	6BK7	6BK7	9AJ	Replace with original type tube only
B	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V4	Converter	12AT7	12AT7	9A	
V5	1st. Video IF Amp.	6CB6	6CB6	7CM	
V6	2nd. Video IF Amp	6CB6	6CB6	7CM	
V7	3rd. Video IF Amp	6CB6	6CB6	7CM	
V8	Video Output	6AS6	6AS6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AV6	6AV6	7BT	
V12	Audio Output	25L6GT	25L6GT	7B	
V13	Sync Clipper	6BE6	6BE6	7CH	
V14A	Vert. Oscillator-Vert. Output	12 BH7	12BH7	9A	
B	Vert. Oscillator-Vert. Output	12SN7GT	12SN7GT	8BD	
V15	Discriminator	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	35BQ6GT	35BQ6GT	8AM	
V18	Damper	6AX4GT	6AX4GT	4CG	
V19	HV Rectifier	1X2A	1X2A	5Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: AIR LINE PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V20A	17HP4	17HP4	17HP4	12C	
B		17RP4	17RP4	12C	
B	21FP4A	21FP4A	21FP4A	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIR LINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	100	150	8C-20709	AFBS1-69		XA003		FP115	TVL-1423	
C2	100	150	8C-20684	AFBS1-69		XA003		FP115	TVL-1423	
C3A	≡100	100	8C-20608	AFH4-110		DO75		FP424.1	TVL-4638	
B	≡10	400		PR825/100		HR825A		TC2501		
C	100	25								
D	≡10	75								
C4	50	300	8C-22111	PR8450/50		HR8035		TC88	TVA-1713	
C5A	≡10	300	8C-20954	AFH3-134		CO21		FP330.5	TVL-3580	
B	≡10	300								
C	10	15								
C6	8	450	8C-13453	PR8450/8		HR845A		TC71	TVA-1704	
C7	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C8	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C9	1000		8G-20878	CN-1-001	MFT-1000				503C-D1	
C10A	1000		8G-19506	BPD-2X001	DD3-102	TM5DD1	81J-001	DCD-521	5HK-3D1	
B	1000									
C11	120		8G-21315							
C12A	1000		8G-19506	BPD-2X001	DD3-102	TM5DD1	81J-001	DCD-521	5HK-3D1	
B	1000									
C13	47		8G-20740	BPD-00047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C14	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-531	5HK-D1	
C15	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C16	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C17	33		8G-11892	SI33NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C18	5000		8G-13962	BPD-005	MD-502	TM5D5	81J-005	DC-525	5HK-D5	
C19	8		8G-20880		TCZ-1		NP0K-010		5TCCB-V1	
C20	220		8G-18045	SI220	D6-221		GP2K-221	UC-5522	5GA-T22	
C21	1000		8G-20878	CN-1-001	MFT-1000				503C-D1	
C22	1.3		8G-12495-8	SIL.3NP0	TCZ-1.2		NP0K-1R3		5TCCB-V12	
C23	1000		8G-20650	BPD-001	DD-102	TM5D1	80J-001	DC-521	5HK-D1	
C24	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C25	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C26	15		8G-13017	SI15NP0	TCZ-15		NP0K-150	ZT-5415	5TCC-Q15	
C27	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C28	1		8G-12495-2	SIPP0	TCZ-1		NP0K-010		5TCCB-V1	
C29	4		8G-19314	SI4NP0	TCZ-4		NP0K-040			
C30	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C31	1000		8G-20878	CN-1-001	MFT-1000				503C-D1	
C32	1000		8G-20878	CN-1-001	MFT-1000				503C-D1	
C33	1		8G-12495-2	SI1NP0	TCZ-1		NP0K-010		5TCCB-V1	
C34	61		8G-11891							
C35	7		8G-15224							
C36	2.5		8G-19566							
C37	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-531	5HK-D1	
C38	1		8G-12495-2	SIPP0	TCZ-1		NP0K-010		5TCCB-V1	
C39	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-531	5HK-D1	
C40	1000		8G-20878	CN-1-001	MFT-1000				503C-D1	
C41	8		8G-20879	BPD-008	MD-502	TM5D5	81J-005	DC-525	5HK-D5	
C42	5000		8G-13962	BPD-005	MD-502	TM5D5	81J-005	DC-525	5HK-D5	
C43	10		8G-11789	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C44	100	500	8P3-8	1468-0001	D6-101	5W5T1	GP1K-101	MC3135	1F4-31	
C45	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C46	5000		8G-13962	BPD-005	MD-502	TM5D5	81J-005	DC-525	5HK-D5	
C47	2000		8G-19522	SI2000	D8-202	TM5D2	GP2-333-202	UC-522	5HK-D2	
C48	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C49	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C50	680		8G-21105	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C51	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C52	5000		8G-13962	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C53	5000		8G-13962	BPD-005	MD-502	TM5D5	81J-005	DC-525	5HK-D5	
C54	1000		8G-13201	SI1000	D6-102	TM5D1	GP2L-102	UC-531	5HK-D1	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIR LINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C55	5		8G-12166	815	TCZ-4.7	TW5Q5	GP1K-050	ZT-555	5GA-V5	
C56	.22	200	8J-18082	P488-32		PTE4P22		PT4025	4TM-P22	
C57	.1	300	8J-18085	P288-1	DF-104	PTF1		PT401	2TM-P1	
C58	5000		8G-13962	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C59	.1	400	8J-18083	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C60	5		8G-12166	815NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C61	22		8G-13909	SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C62	47		8G-12198	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C63	.0022	400	8J-20834	P688-0022	D6-222	PTE8D22	GP2-333-222	PT8222	6TM-D22	
C64	5000		8G-13962	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C65	5000		8G-13962	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C66	560	500	8P3-122							
C67	.047	400	8G-21207	BPD-005	MD-502	TM5D5	81J-005	DC-525	5HK-D5	
C68	.01	400	8J-20582	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C69	.01	400	8J-20582	P488-01	D6-103	PTF4S1	GP2-333-103	PT411	4TM-S1	
C70	.01	400	8J-20582	P488-01	D6-103	PTF4S1	GP2-333-103	PT411	4TM-S1	
C71	.015	400	8J-20594	P488-015		PTE6S15		PT6115	6TM-S15	
C72	.0022	400	8J-20590	P688-0022	D6- 222	PTE8D22	GP2-333-222	PT8222	6TM-D22	
C73	.1	400	8J-18083	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C74	.0047	400	8J-20592	P688-0047	D6-472	PTE6D47	GP2-338-472	PT6247	6TM-D47	
C75	.022	200	8J-18086	P488-023		PTE4S22		PT4123	4TM-S23	
C76	.047	100	8J-18090	P488-047	DF-503	PTE4P47		PT4147	4TM-P47	
C77	.047	400	8J-18081	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C78	.047	200	8J-18090	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C79	.01	400	8J-18084	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C80	.47	400	8J-21505	484-47		PJ4P5		PT4P5	4TM-P5	
C81	.01	600	8J-18097	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C82	100	500	8P3-113	1469-0001		SR5T1		MCB3235	MS-31	
C83	220	500	8P3-117							
C84	680	500	8P3-123	1479-0007		2R5T7			MS-37	
C85	220	500	8P3-117							
C86	680	500	8P3-123	1479-0007		2R5T7			MS-37	
C87	.01	400	8J-20582	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C88	.22	200	8J-18082	P488-22		PTE4P22		PT4025	4TM-P22	
C89	.047	200	8J-18090	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C90	.0039	600	8J-20613	1464-004		IDR5D4		MCB463	MS-34	
C91	220	500	8P3-117							
C92	330	500	8P3-119							
C93	560	500	8P3-122							
C94	.01	400	8J-18084	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C95	47		8G-12198	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C96	.047	400	8J-18081	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C97	.22	200	8J-18082	P488-22		PTE4P22		PT4025	4TM-P22	
C98	1000		8G-19505	BPD-001	DD-102	TM5D1	80L-001	DC-521	5HK-D1	
C99	470	1000	8G-21440			IDR5D4		MCB463	MS-34	
C100	47		8G-12198							
C101	.1	400	8J-18083	P488-1		PTE4P1		PT401	4TM-P1	
C102	.47	200	8J-21505	P288-47		PJ2P5		PT405	2TM-P47	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIR LINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250KΩ	½	A-10B-21476	Q17-111	AG-15-8	AB-7	U-8	Picture
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R1A
R2A	1Meg	½	A-10A-21464		AG-63-Z		U-53	Volume
B	Shaft		Not Req.		FS-5		DS-36	Attach to R2A
C	Switch		Not req.		SWB		US-36	Attach to R2A
R3A	100KΩ	½	A-10B-17275	Q11-128	AG-49-8	AB-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R4A	500KΩ	½	A-10B-20558	Q11-133	AG-58-8	AB-59	SU-50	Sync Stability
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R4A
R5A	500KΩ	½	A-10B-20558	Q11-133	AG-58-8	AB-59	SU-50	Vert. Hold
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R5A
R6A	750KΩ	½	A-10B-19220	Q11-136	AG-61-8	AB-69	U-51	Vert. Size
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R6A
R7	4000Ω	1	A-10B-21052					Vert. Linearity-wire wound
	with 1000Ω slop							

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIR LINE PART No.	IRC PART No.	NOTES
R8	580KΩ	½	9B1-96		
R9	4700Ω	½	9B1-70	BTS-4700	
R10	22Ω	½	9B1-42	BTS-22	
R11	180Ω 5%	½	9B1-160	BTS-180 5%	
R12	22KΩ	2		BTB-22K	
R13	22KΩ	2		BTB-22K	
R14	10KΩ	½	9B1-74		
R15	3900Ω	½	9B1-69	BTS-3900	
R16	1500Ω	½	9B1-64	BTS-1500	
R17	27KΩ	½	9B1-79		
R18	22Ω	½	9B1-42		
R19	470KΩ	½	9B1-39	BTS-470K	
R20	1000Ω	½	9B1-62	BTS-1000	
R21	10KΩ	½	9B1-74		
R22	10Ω	½	9B1-38		
R23	1000Ω	½	9B1-62	BTS-1000	
R24	22KΩ	½	9B1-78		
R25	220KΩ	½	9B1-87	BTS-220K	
R26	1000Ω	½	9B1-13	BTS-1000	
R27	27KΩ	1	9B2-79	BTA-27K	
R28	10KΩ	½	9B1-74		
R29	2200Ω	½	9B1-66	BTS-2200	
R30	100Ω	½	9B1-50	BTS-100	
R31	47KΩ	½	9B1-83	BTS-47K	
R32	47KΩ	½	9B1-82	BTS-47K	
R33	8200Ω	½	9B1-73		
R34	47Ω	½	9B1-48	BTS-47	
R35	1000Ω	½	9B1-13	BTS-1000	
R36	47KΩ	½	9B1-82		
R37	47Ω	½	9B1-48	BTS-47	
R38	1000Ω	½	9B1-13	BTS-1000	
R39	82Ω	½	9B1-49	BTS-82	
R40	1000Ω	½	9B1-13	BTS-1000	
R41	22KΩ	½	9B1-78	BTS-22K	
R42	5600Ω	½	9B1-71	BTS-5600	
R43	470KΩ	½	9B1-94	BTS-470K	
R44	27KΩ	1	9B2-79	BTA-27K	
R45	15KΩ	½	9B1-76	BTS-15K	
R46	5600Ω	½	9B1-71	BTS-5600	
R47	5600Ω	2	9B4-71	BTB-5600	
R48	150KΩ	½	9B1-88	BTS-150K	
R49	1000Ω	½	9B1-62	BTS-1000	
R50	100KΩ	½	9B1-86		
R51	120Ω	½	9B1-51	BTS-120	
R52	8200Ω	2	9B4-73	BTB-8200	
R53	47Ω	½	9B1-48	BTS-47	
R54	22KΩ	½	9B1-78	BTS-22K	
R55	22KΩ	½	9B1-78	BTS-22K	
R56	10Meg	½	9B1-110	BTS-10Meg	
R57	220KΩ	½	9B1-90	BTS-220K	
R58	470KΩ	½	9B1-94	BTS-470K	
R59	120Ω	1	9B2-51	BTA-120	
R60	2200Ω	5	9C12-1103	1 3/4A-2250	
R61	10Meg	½	9B1-110	BTS-10Meg	

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIR LINE PART No.	IRC PART No.	NOTES
R62	10Meg	½	9B1-110	BTA-10Meg	
R63	1Meg	½	9B1-98	BTS-1Meg	
R64	47KΩ	½	9B1-82	BTS-47K	
R65	470KΩ	½	9B1-94	BTS-470K	
R66	1Meg	½	9B1-98	BTS-1Meg	
R67	22KΩ	5	9C12-1115	1 3/4A-22500	
R68	33KΩ	½	9B1-80	BTS-33K	
R69	33KΩ	½	9B1-80	BTS-33K	
R70	220KΩ	½	9B1-90	BTS-220K	
R71	47KΩ	½	9B1-82	BTS-47K	
R72	560KΩ	½	9B1-95	BTS-560K	
R73	12KΩ	½	9B1-75	BTS-12K	
R74	8200Ω	½	9B1-73	BTS-8200	
R75	3300Ω	½	9B1-68	BTS-3300	
R76	1800Ω	½	9B1-66	BTS-1800	
R77	1Meg	½	9B1-98	BTS-1Meg	
R78	220KΩ	½	9B1-90	BTS-220K	
R79	100KΩ	½	9B1-86	BTS-100K	
R80	150KΩ	½	9B1-88	BTA-150K	
R81	1000Ω	½	9B1-62	BTS-1000	
R82	1000Ω	½	9B1-62	BTS-1000	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIR LINE PART No.	IRC PART No.	NOTES
R83	150KΩ	½	9B1-88	BTS-150K	
R84	2.2Meg	½	9B1-102	BTS-2.2Meg	
R85	2.2Meg	½	9B1-102	BTS-2.2Meg	
R86	150KΩ	½	9B1-88	BTS-150K	
R87	680KΩ	½	9B1-96	BTS-680K	
R88	56KΩ	½	9B1-83	BTS-56K	
R89	680KΩ	½	9B1-96	BTS-680K	
R90	820KΩ	½	9B1-97	BTS-820K	
R91	82Ω	½	9B1-61	BTS-820	
R92	5600Ω	1	9B2-71	BTA-5600	
R93	150KΩ	½	9B1-88	BTS-150K	
R94	100KΩ	½	9B1-86	BTS-100K	
R95	470KΩ	½	9B1-94	BTS-470K	
R96	100Ω	½	9B1-50		
R97	8200Ω	2	9B4-73	BTB-8200	
R98	3.3Ω	½	9C1-1070		
R99	175Ω	20	9M-21715		
R100	1500Ω	10	9M- 20736	1 3/4A-1500	
R101	5.6Ω	½	9C-1073		
R102	470KΩ	½	9B1-94	BTS-470K	
R103	5.6Ω	*			

* Fusible Resistor - 5.6Ω, 1 Amp.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIR LINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	115VAC @.44A	6.3VAC @ 6.1A			12D-21160			FO-66 ①	F-16X ①	

① Drill one new mounting hole.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: AIR LINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	180Ω	990Ω	12M-18341-3	A-8125	A-3008	TBO-5	A-97X		Vert. Osc. Trans.
T3	216Ωtap @8Ω,	2.5Ω tap @ 2.5Ω	20J-21025 20J-21033-1 ①						Horiz. Output Trans.
	16Ω,	SEC. 2							
	26Ω	0Ω							
T4	1077Ω tap ①		12C-20761-1	A-8141	A-3039	TBO-12	A-104X		Vert. Output Trans.
	7Ω								
T5A	13Ω		20J-21180	DY-8 ②	MDF-70①	TY-2 ①	Y-12 ①		Horiz. Deflection Coils
B	65Ω		20J-21514 ②						Vert. Deflection Coils

① Alternate horizontal output transformer.
② Alternate yoke for 21" Models.
③ Use original deflection coil network

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AIR LINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	2.5KΩ	3.15Ω	178Ω	.58Ω	12C21215	A-3876	A-2928	RO-2	S-1X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: AIR LINE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	5"	PM	3.15Ω	18A-21216	524	5A07	① Used in Model 35BR-3168A
B	6"	PM	3.15Ω	18A-21433 ①	624	6A1	② Used in Models 35BR-3167A, 35BR-3169A
C	10"	PM	3.15Ω	18A-21443 ②	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: AIR LINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Fil. Choke	0Ω		18A-20469				
L2	Cathode Choke	0Ω		20J-20265				
L3	UHF IF Coupling	0Ω		18A-21934				
L4	UHF IF Input Coil	0Ω		20J- 21933				Tapped
L5	UHF IF Output Coil	.8Ω		20J-20483				
L6	VHF Ant. Trans.	0Ω CT	0Ω	13E-20767				High Channel
L7	VHF Ant. Transf	0Ω CT	0Ω	13E-21189				Low Channel
L8	Fil. Choke	.1Ω		18A-17937	19-3001	TV-189	6175	3 Microhenries
L9	Resist. Coil	0Ω		13M-20781				
L10	Cathode Choke	0Ω		13M-20780				
L11	RF Coil	0Ω		13E-17140				High Channel
L12	RF Choke	.9Ω		18A-17128				
L13	RF Coil	0Ω		13E-13046				Low Channel
L14	Mixer Grid Coil	0Ω		13E-17140				High Channel
L15	Mixer Grid Coil	0Ω		13E-13046				Low Channel
L16	Fil. Choke	.1Ω		18A-20777				
L17	Osc. Coil	0Ω		13E-17140				High Channel
L18	Osc. Coil	0Ω		13D-12155				Low Channel
L19	RF Choke	.1Ω		18A-21656	19-3001	TV-189	4602	1 Microhenry

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L20	RF Choke	1.9Ω		201-15608	19-3036	TV-180	4626	20 Microhenries
L21	1st. Video IF	.3Ω		201-20782	17-1003	TV-102 †	6188 †	
L22	Fil. Choke	.2Ω		16A-17937	19-3001	TV-189	6175	3 Microhenries
L23	RF Choke	1.8Ω		16A-18676			4606	2.2 Microhenries, (IRC part #CLA)
L24	2nd. Video IF	.2Ω		201-21111				Includes 47MMF Cap., (part #8G-19731)
L25	Fil. Choke	.2Ω		16A-17937	19-3001	TV-189	6175	3 Microhenries
L26	RF Choke	1.8Ω		16A-18676			4606	2.2 Microhenries (IRC part #CLA)
L27	3rd. Video IF	.2Ω (tapped)		201-21494				Includes 10KΩ resistor, part #9B1-74, 470MMF Cap., part #8G-11732 and 47MMF cap., part #8G-19731
L28	RF Choke	2.2Ω		201-15608	19-3036	TV-180	4626	20 Microhenries
L29	RF Choke	2.2Ω		201-15608	19-3036	TV-180	4626	20 Microhenries
L30	4th. Video IF	.3Ω	.4Ω	13B-21167				Includes CK-706 Crystal detector, 5MMF Cap. (part #8G-12166) & Series Peaking Coil (part #201-15608)
L31	Series Peaking Coil	2.4Ω		201-20265	19-3036	TV-180	6176	38 Microhenries
L32	Series Peaking Coil	8Ω		16A-20970	19-3250	TV-185	6181	270 Microhenries
L33	Shunt Peaking Coil	9Ω		16A-21391	19-3300		6155	305 Microhenries
L34	Shunt Peaking Coil	8Ω		16A-20970	19-3250	TV-185	6181	270 Microhenries
L35	Sound IF	1.5Ω		201-21398	17-3400	TV-151	1470	
L36	Ratio Det.	10Ω	.5Ω CT	*13M-21644	17-3493	TV-115 ▲	6205 ▲	Tertiary winding-.35Ω
L37	Horiz. Osc.	85Ω		201-20291	19-1575	TV-163 †	6210 †	
L38	RF Choke	2.2Ω		201-15608	19-3036	TV-180	4626	20 Microhenries
L39	RF Choke	2.2Ω		201-15608	19-3036	TV-180	4626	20 Microhenries

* Alternate part #13M-19643
† Enlarge mounting hole.
▲ Use adaptor plate.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: AIR LINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L40	.280ADC	71Ω	2.92 Hy.	16A21214	C-2326	C-2991 ①	TR-3300 ①	C-17X

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: AIR LINE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.280ADC	21J20097	NH5	6Q4	1090	6S300	300
M2	.280ADC	21J20097	NH5	6Q4	1090	6S300	300

MISCELLANEOUS

ITEM No.	PART NAME	AIR LINE PART No.	NOTES
M3	Pilot Lamp	46A-10793	Type #47
M4A	VHF RF Tuner		6BK7 RF Amp. tube
B	VHF RF Tuner		6BQ7A RF Amp. tube
M5A	UHF RF Tuner		6BK7 UHF IF Amp. tube
B	UHF RF Tuner		6BQ7A UHF IF Amp. tube
M6	Switch	20B-21506	Local-Suburban-Fringe
M7	Switch		VHF-UHF Selector
M8	Centering Magnet	16M-20697	
M9	Ion Trap	16M-19906	
M10	Linearity Magnet	16M-21526	17" Models only (one used)
M11	Anti-pin Cushion Magnet	16M-21499	21" Models only (Two used)
	Safety Glass	30M-21645	Model 35BR-3158A
	Safety Glass	30M-21647	Models 35BR-3167A, 35BR-3168A, 35BR-3169A
	Knob	5B-21581-A76	On/Off/Volume, Models 35BR-3158A, 35BR-3167A, 35BR-3168A
	Knob	5B-21581-A56	On/Off/Volume, Model 35BR-3169A
	Knob	5B-21574-A76	Tuning, Models 35BR-3158A, 35BR-3167A, 35BR-3168A
	Knob	5B-21574-A56	Tuning, Model 35BR-3169A
	Knob	5B-21273-29	Star (2 Used)
	RF Dial Cord	200-21772	With Ribbon (4 11/16")
	RF Dial Cord	200-21357	With Lug (5")
	Osc. Dial Cord	200-21309	With Lug & Spring (10 9/16")
	Osc. Dial Cord	200-21310	With Lug & Spring (7 7/8")

TROUBLE SHOOTING AIDS (cont)

POWER

DEAD SET

If filaments fail to light, Check AC interlock assembly and switch on volume control. If filaments light, Check R103, M1, M2 and other components associated with the B+ network.

SMALL AND/ OR DIM RASTER

Check M1, M2, C1, C2, C3A and other components of the B+ network.

PROPERTY OF
L. F. MANTSHI

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V16, V17, V18 and V19. Check waveform at W14.

If Satisfactory	If Unsatisfactory
Check C96, C97, C98, C99, C4, R97, R98, T3, T5A and other assoicated components.	Check C91, C92, C93, C94, C95 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V16, V17, V18 and V19. Check B+.

If Satisfactory	If Unsatisfactory
Proceed as outlined under "Loss of High Voltage".	Check M1, M2, C1, C2, C3A and other associated circuit components.

BLOOMING

Check by substitution V16, V17, V18 and V19. Check R98, T3, T5A, R96, C96 and other assocaited components. Check B+ rectifiers and filter components. Check picture tube.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check UHF-VHF switch position. Check by substitution V3, V4, V5, V6, V17 and V8. Check video detector crystal and assembly. Check components associated with these stages.

NO RASTER NO SOUND NO PIX

See "Dead Set".

TOTAL LOSS OF SYNC

Substitute V13. Check associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

UHF

If it becomes necessary to replace the crystal detector or other soldered in components, it will be necessary to remove the picture tube.

When servicing the UHF tuner, care should be exercised not to move or rearrange components or mechanical parts. In replacing any components exact lead length and physical position should be maintained.

If receiver does not operate in UHF position, Check the UHF-VHF switch, substitute the oscillator (6AF4) and cascode amplifier (6BQ7A) tubes. Check voltages at the UHF power socket or cable connection in the receiver.

A check, to determine if the UHF oscillator is functioning, may be made by connecting a 100 micro-amp meter across R10. A reading of 10 to 30 micro-amps should be obtained. To determine if both oscillator and crystal detector are functioning properly, connect a 100 micro-amp meter across R18. A 5 to 40 micro-amp reading should be obtained.

CAUTION! No attempt should be made to readjust the tracking screws, oscillator trimmer screw or oscillator cavity. Precision test equipment is necessary for these adjustments.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of RF tuner oscillator circuit, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

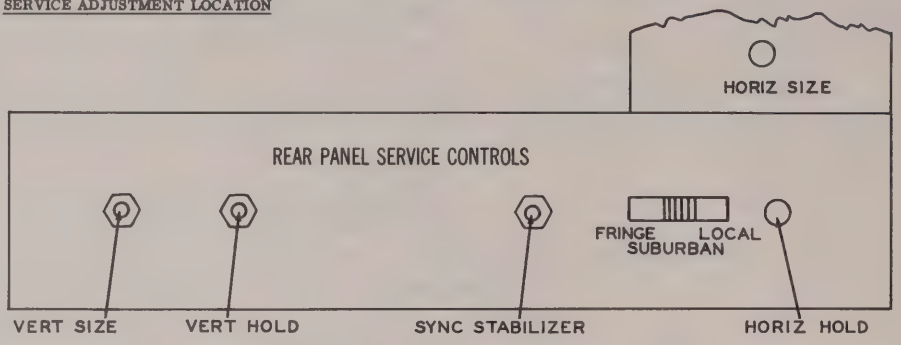
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 screws holding front control panel. Remove panel and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - SYNC STABILIZER CONTROL

The sync stabilizer control should be adjusted to the position which results in the most stable synchronization.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjust the horizontal hold slug (L37) until the picture synchronizes horizontally and make any further adjustment if necessary to set it in the center of its range of synchronization.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L36) located on top of chassis. (See tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke.

Turn the disk-like knob and at the same time rotate the ring around the tube until picture is properly centered.

BUILT-IN ANTENNA TUNING

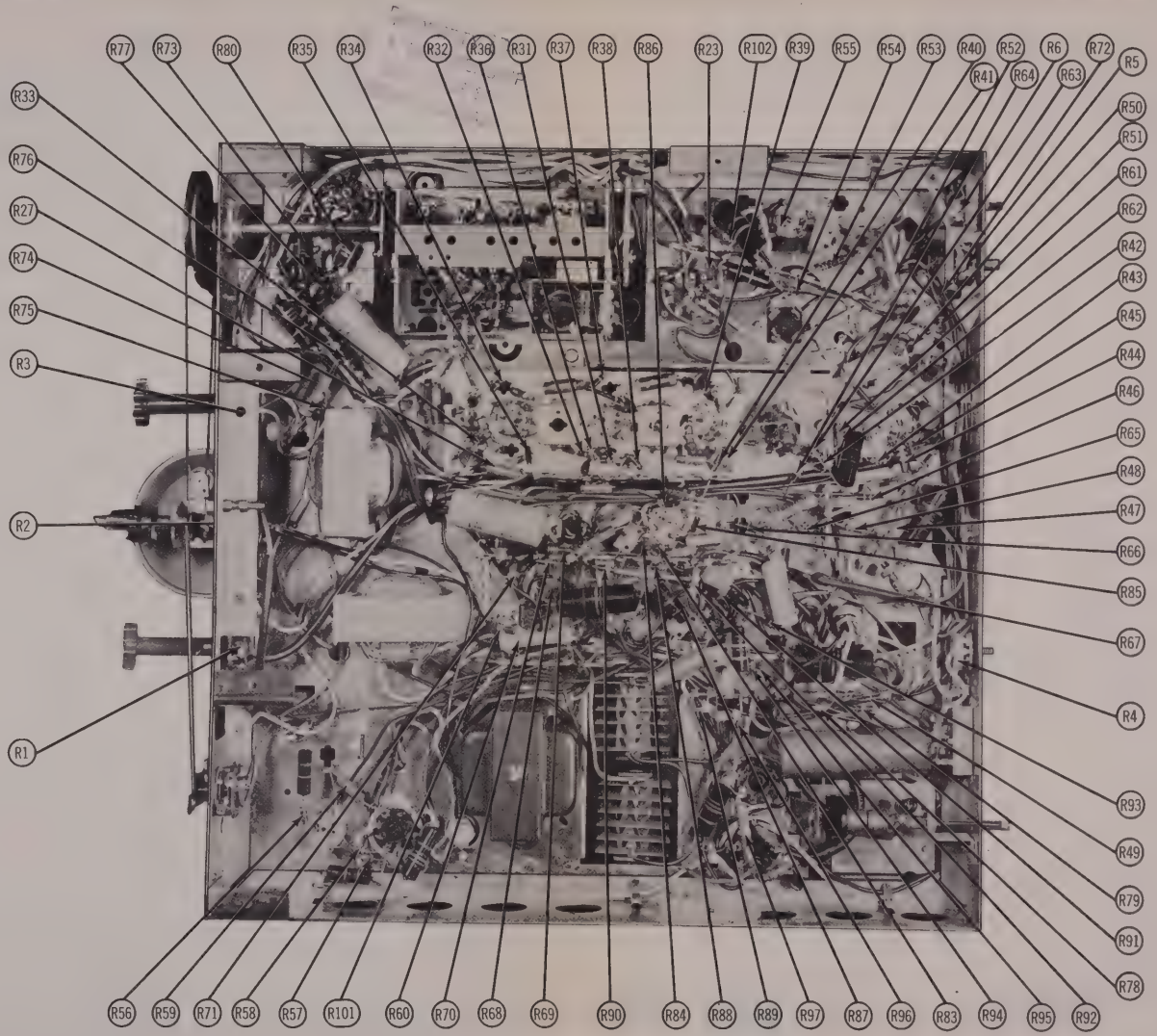
Built-in antenna can be adjusted from the rear of the cabinet. Adjust for a picture of maximum contrast and minimum ghost.

HORIZONTAL LINEARITY MAGNET

Adjust the position of the horizontal linearity magnet (found near neck of picture tube) for best linearity at the right hand side of the picture.

DISASSEMBLY INSTRUCTIONS

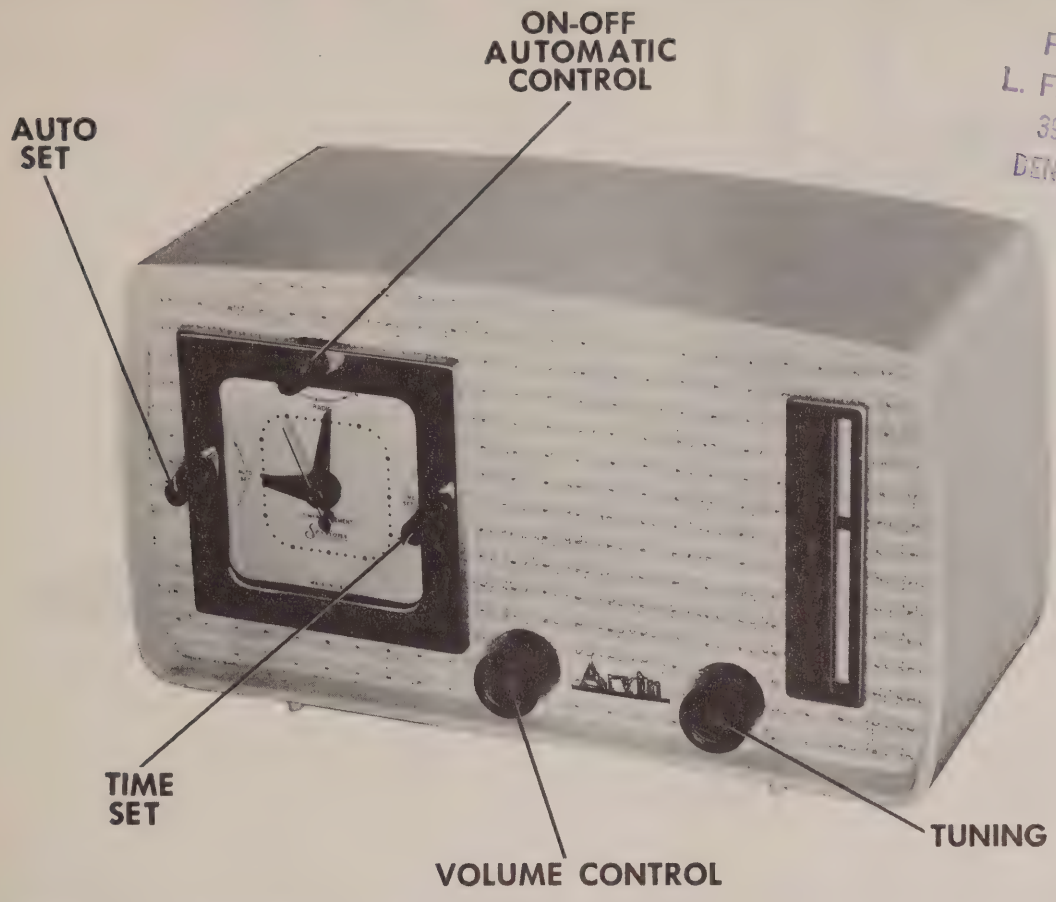
1. Remove 2 push on type control knobs and selector lever from front panel.
2. Disconnect VHF built-in antenna.
3. Remove 4 screws. Remove VHF & UHF antenna strips from rear cover.
4. Remove 4 wood and 1 metal screws. Remove rear cover.
5. Disconnect speaker. Remove 2 speaker nuts. Remove speaker.
6. Remove 6 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO

ARVIN
MODEL 758T (Ch. RE350)



ARVIN
MODEL 758T (Ch. RE350)

TRADE NAME	Arvin Model 758T (Ch. RE350)
MANUFACTURER	Arvin Industries, Columbus, Indiana
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det. -AVC-AF Amp., 50C5 Audio Output, 35 W4 Rectifier
POWER SUPPLY	105 - 120 Volts AC - 60 Cycle
RATING	.32 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1650 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1Mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning gang fully closed and set pointer at last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1 Mfd	High side to antenna stator lug. Low side to B-.	455KC	Tuning Gang Fully Open.	Across Voice Coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001 Mfd to reduce hum modulation.
2.		Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC Signal	"	A6	"
4.		"	600KC	Tune to 600KC Signal	"		Bend tuning gang antenna rotor plates for maximum output.
5.	Check coverage (540 - 1650KC) and calibration at 540, 600, 1000, and 1400KC. If necessary, bend oscillator rotor plates and repeat step 4.						

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ARVIN
MODEL 758T (Ch.RE350)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■50	150	C40736	AFH3-77		CO56				
B	▲30	150						PT415	2TM-S5	
C	20	25								
C2	.05	200	C20067-473	P288-05	DF-503	PJ2S5		ZT-5547	5TCCB-V47	
C3	4.7		SI4.7NP0	TCZ-4.7	D6-103	TM5S1	NP0K-4R7	DC-511	5HK-S1	
C4	10000		C20068-103	BPD-01			GP2-333-103			
C5A	125		*A25264		*PC80		*1406-01		*104C4	
B	5000									
C	125									
C6	.02	400	C20068-203	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C7	.047	400	C20068-473	489ZX-05		PJ4S5		PT415	4TM-S5	
C8	.047	400	C20068-473	489ZX-05		PJ4S5		PT415	4TM-S5	

* Items C5A, C5B, C5C and R6A, R6B are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	C47060	Q13-133	AG-60-Z	BSK-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	22KΩ	½	C20061-223	BTS-22K	
R3	68Ω	½	C20061-680	BTS-68	
R4	2.2Meg	½	C20061-225	BTS-2.2Meg	
R5	10Meg	½	C20061-106	BTS-10Meg	

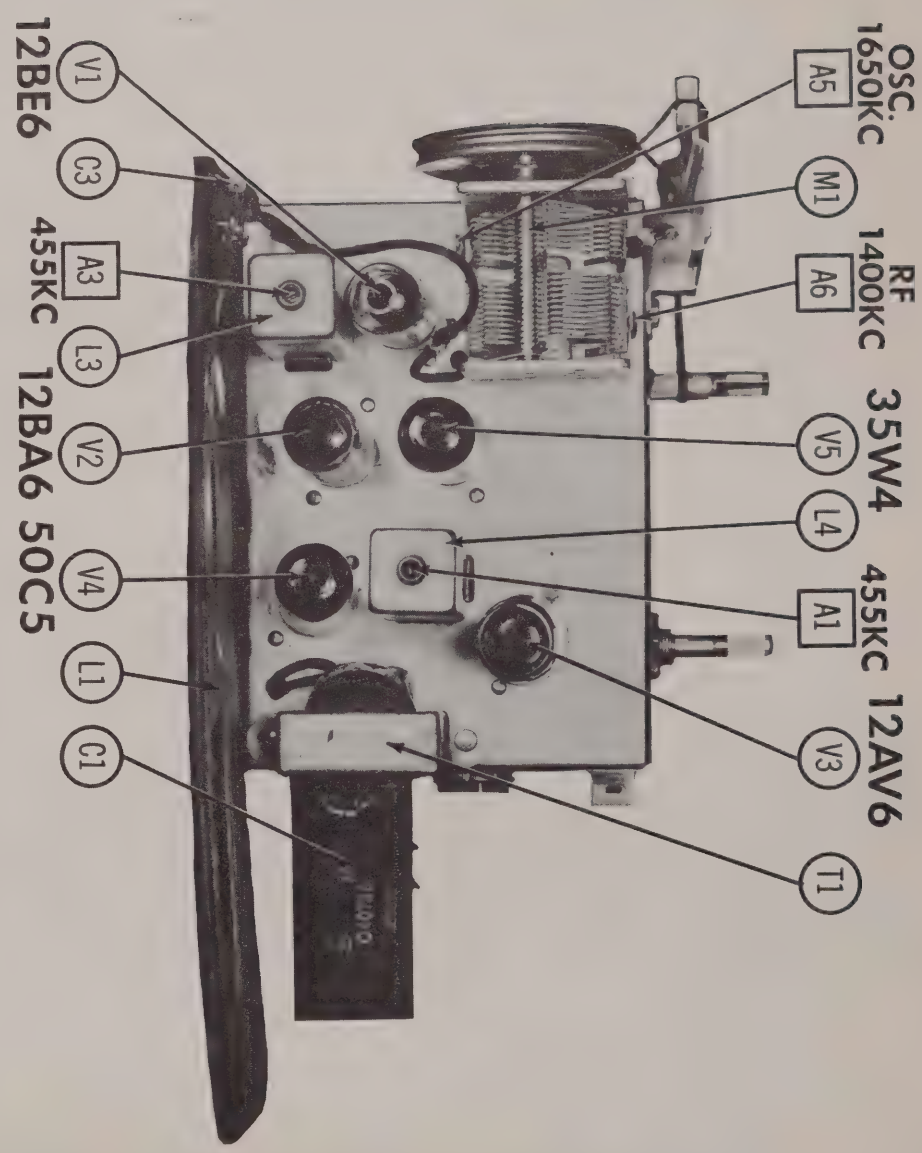
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R6A	500KΩ	½	*A25264		
B	500KΩ	½			
C7	120Ω	½	C22381-121	BTS-120	
C8	1200Ω	1	C20070-122	BTA-1200	
C9	330KΩ	½	C20061-334	BTS-330K	

* Items R6A, R6B, C5A, C5B, C5C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	24KΩ	3.1Ω	180Ω	.32Ω	40746-1	A-3332	A-3025	RO-2 ①	S-1X ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

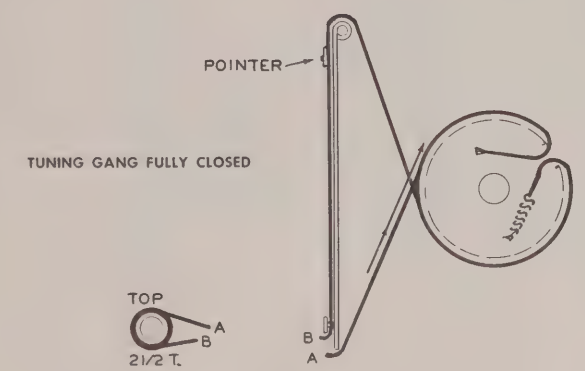
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω	22875	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.3Ω		AC40885-1				Includes back
L2	Osc. Coil	.6Ω	7Ω	AC40886-1	14-1073		69-Osc.	
L3	Input IF	14Ω	14Ω	C40845-1	16-6758	BC-352	12-C1	
L4	Output IF	14Ω	14Ω	C40845-2	16-6770	BC-355	12-C6	

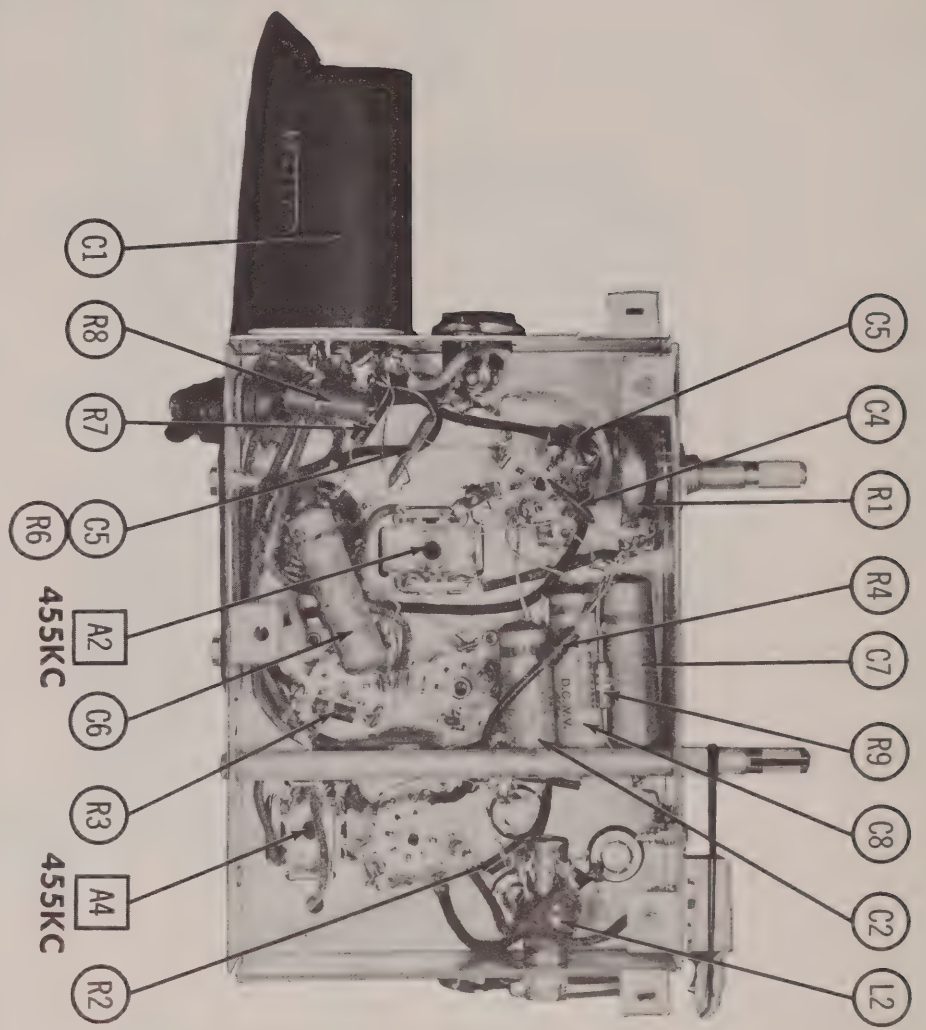
MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Tuning Cap.	C40737	24-325MMF (Ant.), 27-170MMF (Osc.)
	Cabinet	E40744-1	GP Phenolic
	Cabinet	E40744-3	Rosewood Phenolic
	Cabinet	E40744-4	Black Phenolic
	Grill Assy.	AD40749-1	Ivory
	Grill Assy.	AD40749-2	Willow Green
	Grill Assy.	AD40749-3	Rosewood
	Grill Assy.	AD40749-4	Ebony
	Grill Assy.	AD40749-5	Rodeo Tan
	Clock Assy.	AC41005-1	Brown Knob
	Clock Assy.	AC41005-2	Black Knobs
	Knob	C40738-1	Brown, Radio
	Knob	C40738-2	Black, Radio
	Knob	A41004-1	Brown, Clock
	Knob	A41004-2	Black, Clock



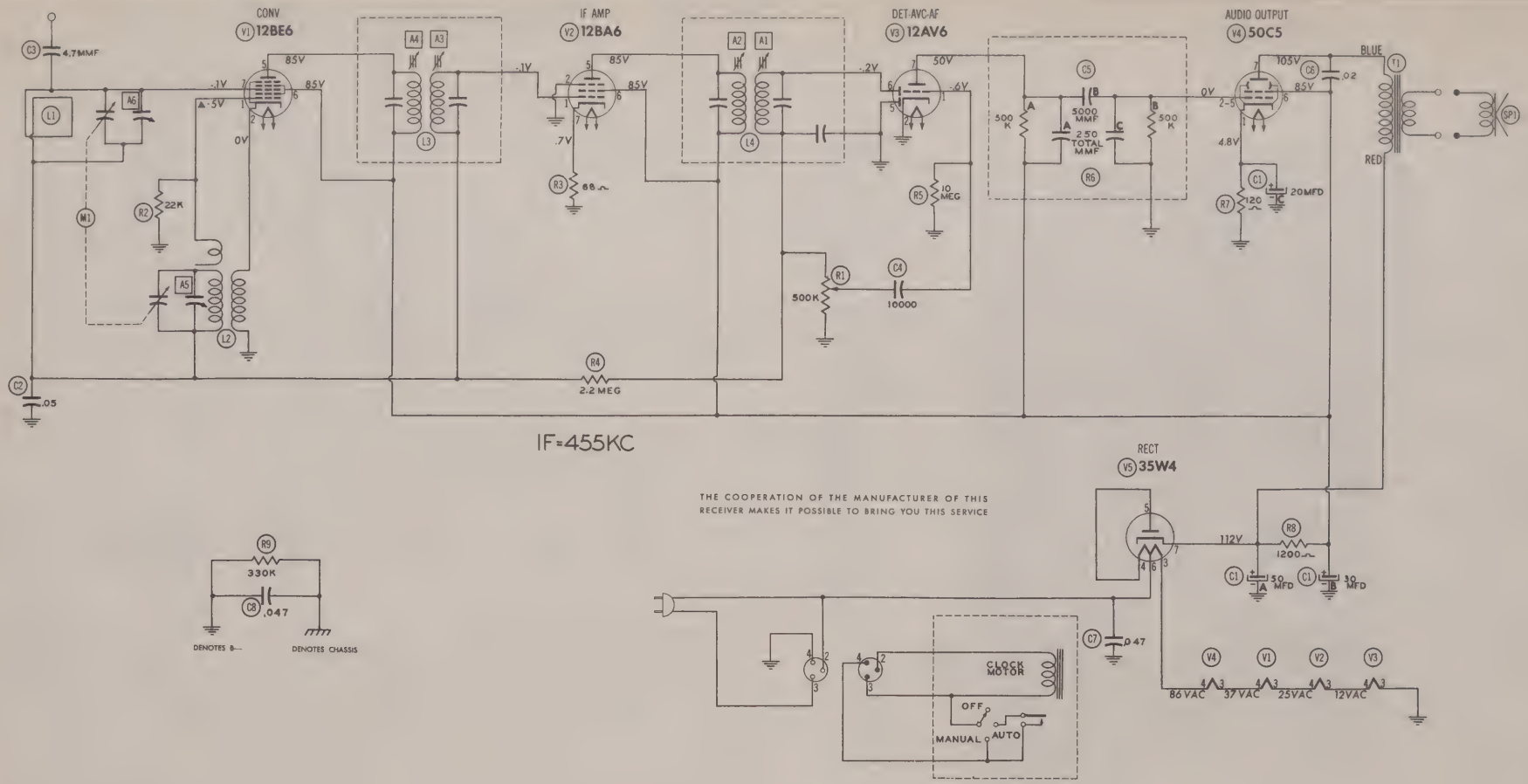
DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



ARVIN
MODEL 758T (Ch. RE350)

ARVIN
MODEL 758T (Ch. RE350)



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	. 6Ω	25Ω	36Ω	†1. 2KΩ	1. 2KΩ	2. 7 Meg.
V 2	12BA6	2. 7 Meg.	0Ω	13Ω	25Ω	†1. 2KΩ	†1. 2KΩ	68Ω
V 3	12AV6	10 Meg.	0Ω	0Ω	13Ω	0Ω	500KΩ	†500KΩ
V 4	50C5	120Ω	500KΩ	36Ω	87Ω	500KΩ	†1. 2KΩ	†180Ω
V 5	35W4	Inf.	Inf.	87Ω	120Ω	120Ω	115Ω	50KΩ

† MEASURED FROM PIN 7 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER

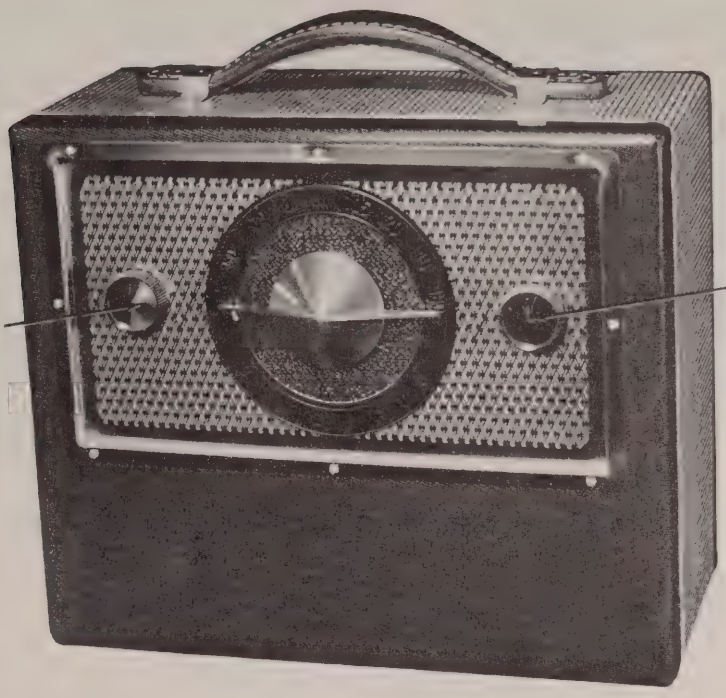
A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1953

221-3

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF



CORONADO
MODEL 35RA4-43-9856A

TRADE NAME	Coronado Model 35RA-43-9856A
SUPPLIER	Gamble-Skogmo Inc., 15 N. 8th. St., Minneapolis, Minn.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Five)	Types 1U4 RF Amp., 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 9 Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.150 Amp. @ 117 Volts AC (or) 68MA @ 9 Volts DC & 18MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	High side to ungrounded side of antenna loop. Low side to B-.	1610KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6	"
4.		Loop	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL 35RA-43-9865A

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	1U4	1U4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amplifier	1U4	1U4	6AR	
V4	Det.-AVC-AF Amp	1U5	1U5	6BW	
V5	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	18-296	AFH4-33		DO86		FP409.4	R1055	
B	30	150						PT415	2TM-S5	
C	200	25								
C2	.05	200	16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	5000		16-177	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C4	10	500	15-186	1468-00001	D6-100	5W5Q1	GP1K-100	MC215	1FM-41	
C5	10000		15-211	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C6	5000		16-177	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C7	.05	200	16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C8	.05	200	16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C9A	200			SI200	D6-201	TM5T2	GP2K-201	UC-532		
B	.002			BPD-002	DD-202	TM5D2	801-002	DC-522		
C	.005		17-103	BPD-005	DD-502	TM5D5	811-005	DC-525	34C4	
D	100			SI100	D6-101	TM5T1	GP1K-101	UC-531		
E	.005			BPD-005	DD-502	TM5D5	811-005	DC-525		
C10	.002	600	16-198	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C11	.05	400	16-179	689ZX-05		PJ4S5		PT615	4TM-S5	
C12	.05	400	16-179	P488-05		PJ4S5		PT615	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	24-201	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

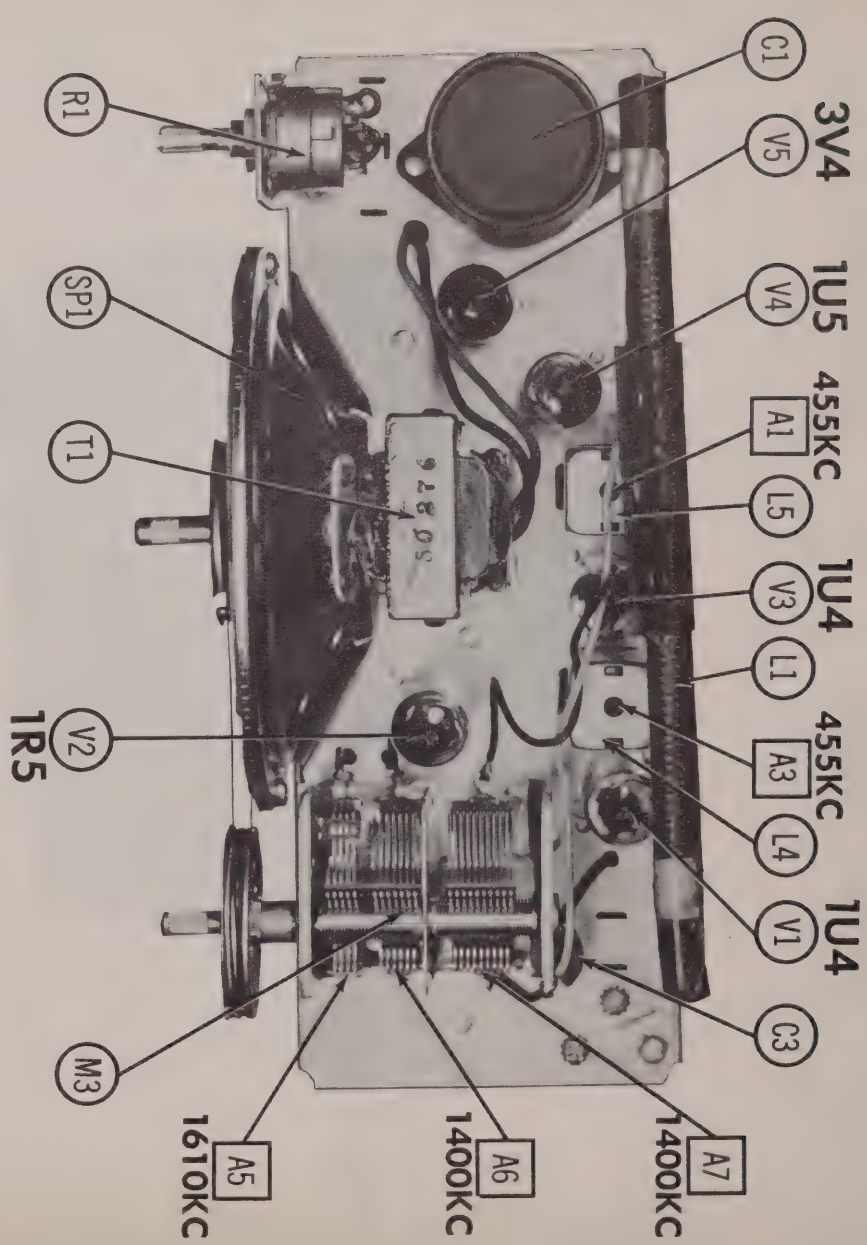
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	NOTES
R2	4.7Meg	½	60-779	BTS-4.7Meg	
R3	22KΩ	½	60-744	BTS-22K	
R4	1500Ω	½	60-729	BTS-1500	
R5	680Ω	½	60-708	BTS-680	
R6	100KΩ	½	60-727	BTS-100K	
R7	27KΩ	½	60-745	BTS-27K	
R8	10Meg	½	60-728	BTS-10Meg	
R9	470Ω	½	60-770	BTS-470	
R10	2.2Meg	½	60-726	BTS-2.2Meg	
R11	47KΩ	½	60-730	BTS-47K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	NOTES
R12	10Meg	½	60-728	BTS-10Meg	
R13	4.7Meg	½	60-779	BTS-4.7Meg	
R14	1Meg	½	60-668	BTS-1Meg	
R15	820KΩ	½	60-799	BTS-820K	
R16	330Ω	½	60-704	BTS-330	
R17	110Ω	3	60-796		
R18	1500Ω	½	60-729	BTS-1500	
R19	2000Ω	10	60-879	1 3/4A-2000	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CORONADO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	10.3KΩ	3.2Ω	710Ω	1Ω	80-276	A-3879 ①	A-2900 ①	RO-301 ①	S-11X ①	① Bend mounting tabs down, file out slots, mounting on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.2Ω	79-405	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		82-74				
L2	RF Coil	11Ω	12Ω	10-535				Sec. Tapped @ 8Ω
L3	Osc. Coil	6.5Ω	12Ω	10-553			70-Osc.*	
L4	Input IF	20Ω	20Ω	10-508	16-6758	BC-352	12-C1	
L5	Output IF	22Ω	22Ω	10-508	16-6758	BC-363	12-C2	

* Disregard tap on secondary winding.

SELENIUM RECTIFIER

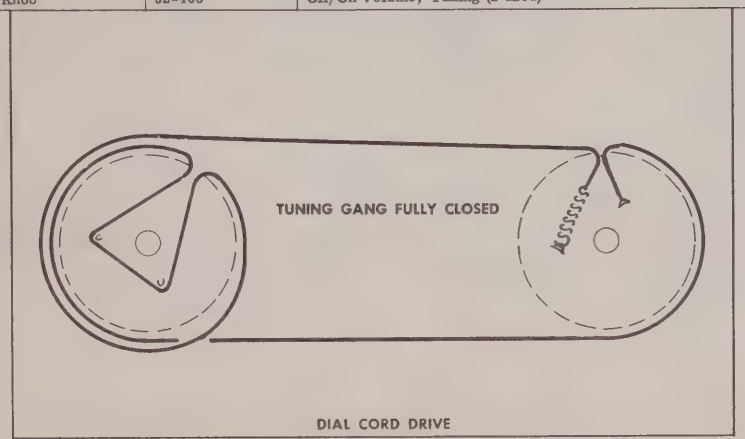
ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	CORONADO PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.065ADC	83-642	NB5	5M4	1003	6S75	75

BATTERIES

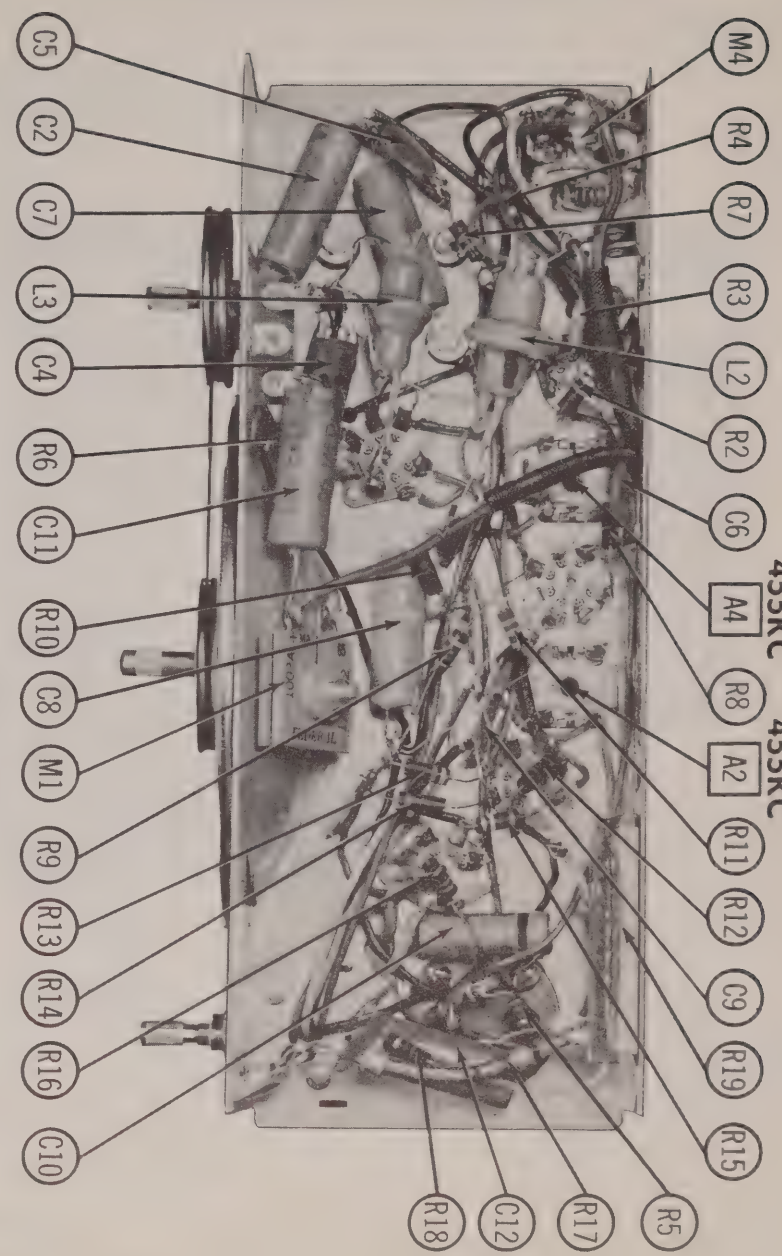
ITEM No.	VOLTAGE	CORONADO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"	43-323			753			F6A60	

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Tuning Cap.	19-219	22-320MMF, 14-215MMF, 9-80MMF
M4	Switch	69-186	Power Selector
	Cabinet	42-553	
	Escutcheon	40-240	
	Pointer	58-97	
	Knob	52-406	Off/On Volume, Tuning (2 used)

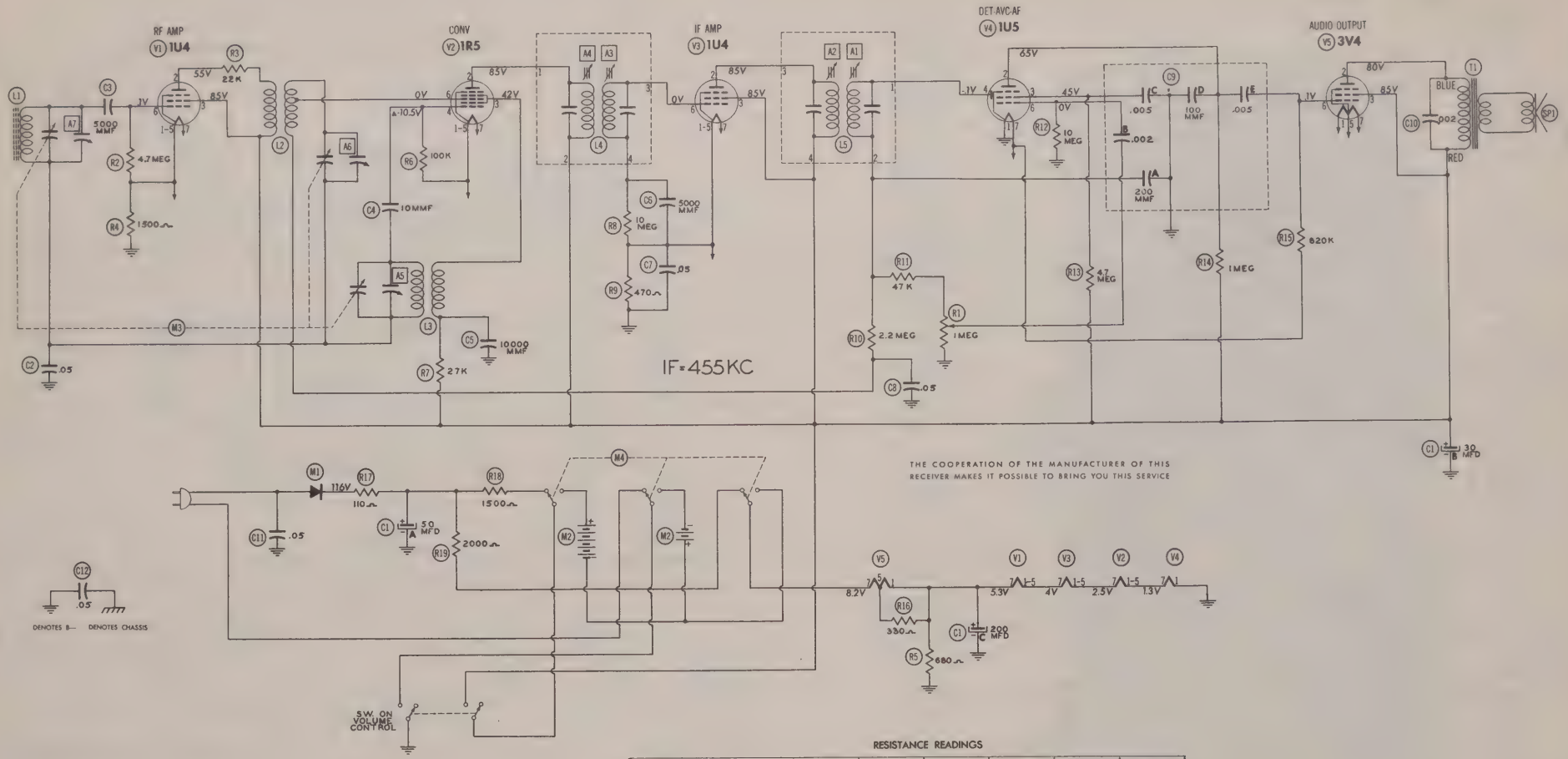


CHASSIS—BOTTOM VIEW



CORONADO
MODEL 35RA-43-9856A

CORONADO
MODEL 35RA-43-9856A



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	†23. 6KΩ	†1. 6KΩ	Inf.	*	4. 7 Meg.	*
V 2	1R5	*	†1. 6KΩ	†28KΩ	100KΩ	*	3. 2 Meg.	*
V 3	1U4	*	†1. 6KΩ	†1. 6KΩ	Inf.	*	10 Meg.	*
V 4	1U5	*	†1 Meg.	†4. 7 Meg.	1 Meg.	10 Meg.	10 Meg.	*
V 5	3V4	*	†2. 3KΩ	†1. 6KΩ	Inf.	■	820KΩ	*

VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN IN AC- DC POSITION.
* DO NOT USE OHMMETER TO MEASURE FILAMENTS RESISTANCE.
† MEASURED FROM OUTPUT OF M1 (SELENIUM RECTIFIER)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1953

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

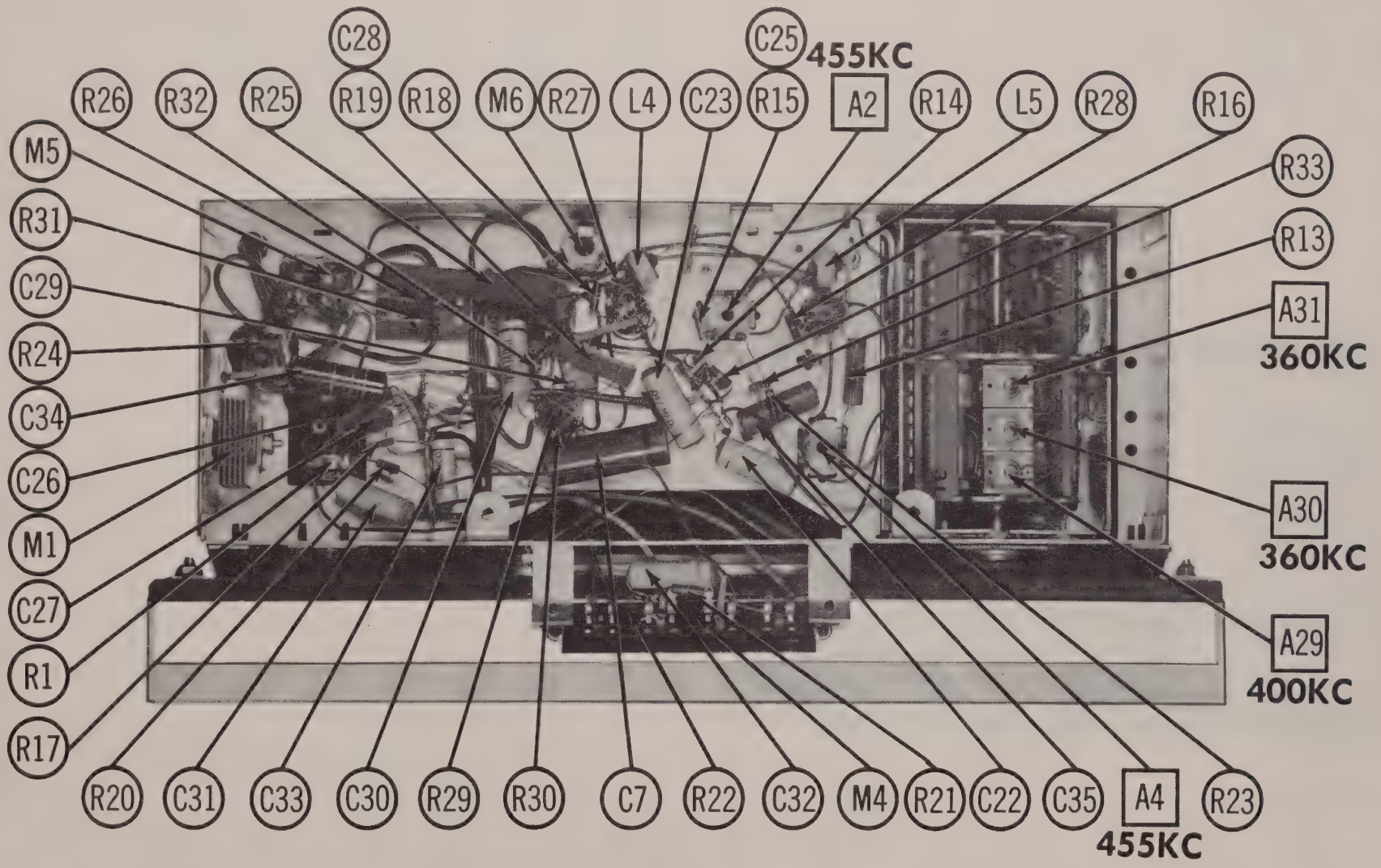
HALLICRAFTERS
MODEL TW-1000 (Run 1)

HALLICRAFTERS
MODEL TW-1000 (Run 1)

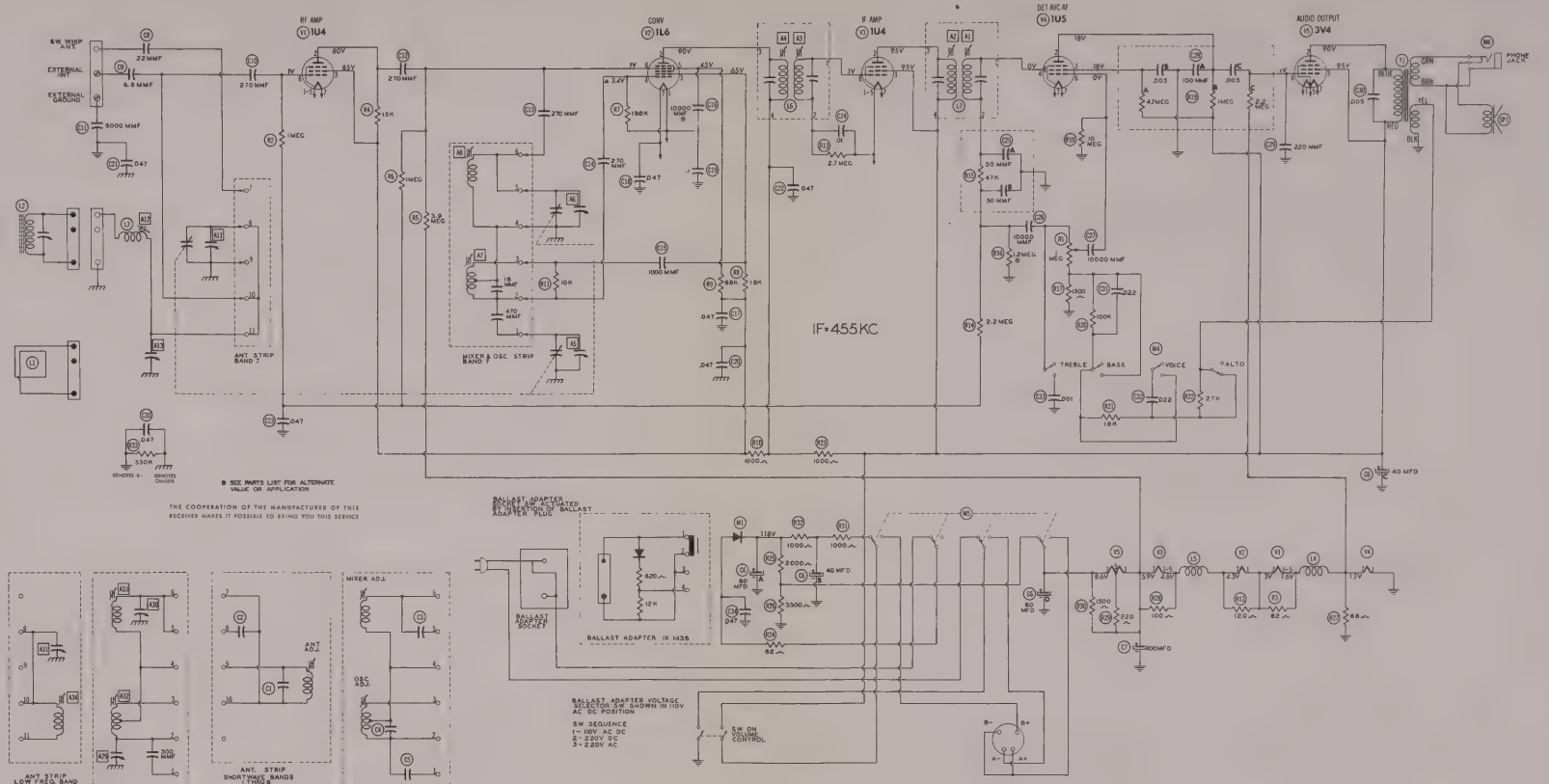
TRADE NAME	Hallicrafters Model TW-1000 (Run 1)	
MANUFACTURER	Hallicrafters Co., 4401 W. 5th Ave., Chicago, Ill.	
TYPE SET	Three Power Portable Superheterodyne Receiver	
TUBES (Five)	Types 1U4 RF Amp., 1L6 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output,	
POWER SUPPLY	105-120 Volts AC-DC (220 Volts Operation With Adapter) or 9 Volts "A" Supply & 90 Volts "B" Supply	
RATING	.15Amp. @ 117 Volts AC or 50MA @ 9 Volts DC & 18MA @ 90 Volts DC	
TUNING RANGES	-Band 1 (1.8 - 3.9 MC)	Band 5 (3.9 - 8.0 MC)
	Band 2 (14.62 - 15.7 MC)	Band 6 (11.42 - 12.3 MC)
	Band 3 (17.32 - 18.2 MC)	Band 7 (540 - 1600KC)
	Band 4 (9.22 - 10.3 MC)	Long Wave (180 - 400KC)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



RADIO CHASSIS-BOTTOM VIEW



1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

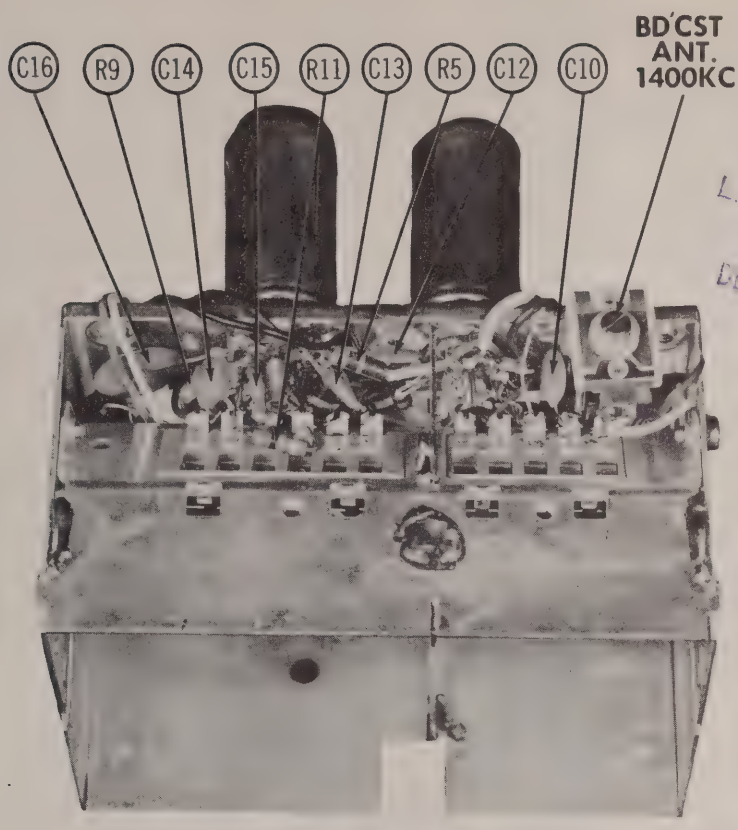
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	†19KΩ	†4KΩ	*	*	4. 4 Meg.	*
V 2	1L6	*	†3KΩ	†22KΩ	180KΩ	†72KΩ	3. 9Meg	*
V 3	1U4	*	†2KΩ	†2KΩ	*	*	2. 7 Meg.	*
V 4	1U5	*	†1 Meg.	†4. 7 Meg.	1. 2 Meg.	*	10 Meg.	*
V 5	3V4	*	†2. 3KΩ	†2KΩ	Inf.	*	2. 2 Meg.	*

VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN IN AC-DC POSITION.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1 (SELENIUM RECTIFIER).
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

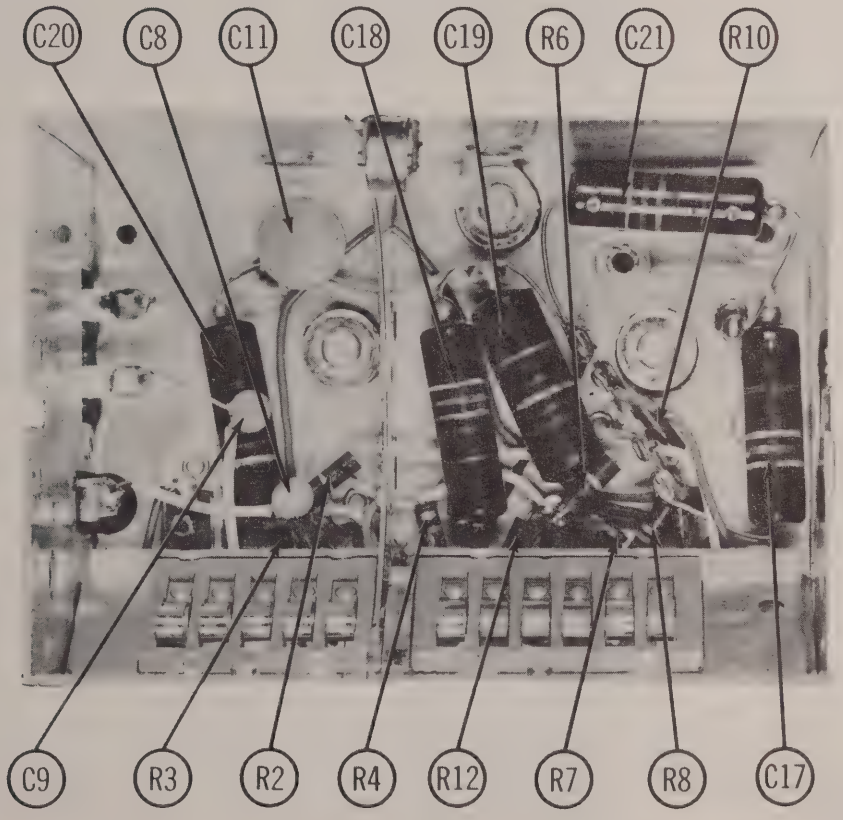
© Howard W Sams & Co., Inc. 1953

221-5



PROPERTY OF
L. F. S[illegible]ENSHIP
[illegible] MOORE ST.
DENVER, COLORADO

RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To gain access to the oscillator slug adjustments it will be necessary to remove the dial and front baffle board. Replace the dial for reference during alignment.
Disconnect the whip antenna and place the loop antenna in operating position.
The oscillator slugs are accessible thru a hole in the tuner turret front as the turret is rotated to each band.
The antenna slugs are reached thru a similar hole in the rear of the tuner.
The RF slugs are reached by removing the antenna strips except for Band 7. The RF slug is then adjusted thru the same hole as the antenna slugs.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1Mfd capacitor in series with the low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1 Mfd.	High side to stator plates of center section of tuning gang. Low side to chassis.	455KC (400~ Mod.)	7	1000KC	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1500KC	"	1500KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	1400KC	"	A6	"
4.		"	600KC	"	600KC	"	A7, A8	"
5.	Fig. 1.	High side thru dummy ant. to whip antenna socket. Low side to chassis.	1.8MC	1	1.8MC	"	A9	Adjust for maximum output.
6.	"	"	2.2MC	"	2.2MC	"	A10	"
7.	"	"	3.5MC	"	3.5MC	"	A11	"
8.		Loop	600KC	7	600KC	"	A12	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
9.		"	1400KC	"	1400KC	"	A13	"
10.	Fig. 2.	High side thru dummy ant. to whip antenna socket. Low side to chassis.	14.6 MC	2	Tuning gang fully closed	"	A14	Adjust for maximum output.
11.	"	"	14.8MC	"	14.8MC	"	A15, A16	"
12.	"	"	17.3MC	3	Tuning gang fully closed	"	A17	"
13.	"	"	17.55MC	"	17.55MC	"	A18, A19	"
14.	"	"	9.2MC	4	Tuning gang fully closed	"	A20	"
15.	"	"	9.5MC	"	9.5MC	"	A21, A22	"
16.	Fig. 1.	High side thru dummy ant. to whip antenna socket. Low side to chassis.	4.0MC	5	4.0MC	"	A23	"
17.	"	"	5.2MC	"	5.2MC	"	A24, A25	"
18.	Fig. 2.	"	11.4MC	6	Tuning gang fully closed	"	A26	"
19.	"	"	11.6MC	"	11.6MC	"	A27, A28	"
20.		Loop	400KC	Long Wave	400KC	"	A29	Fashion loop of several turns of wire and radiate signal into loop of receiver.
21.		"	360KC	"	360KC	"	A30, A31	"
22.		"	200KC	"	200KC	"	A32, A33	"

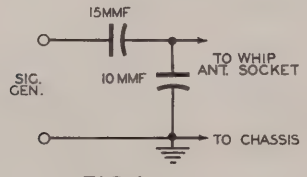


FIG. 1

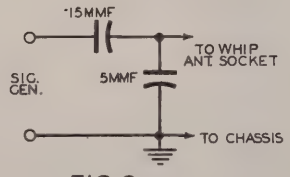


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		Hallicrafters PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	1U4	1U4	6AR	
V2	Converter	1L6	1L6	7DC	
V3	IF Amplifier	1U4	1U4	6AR	
V4	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V5	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

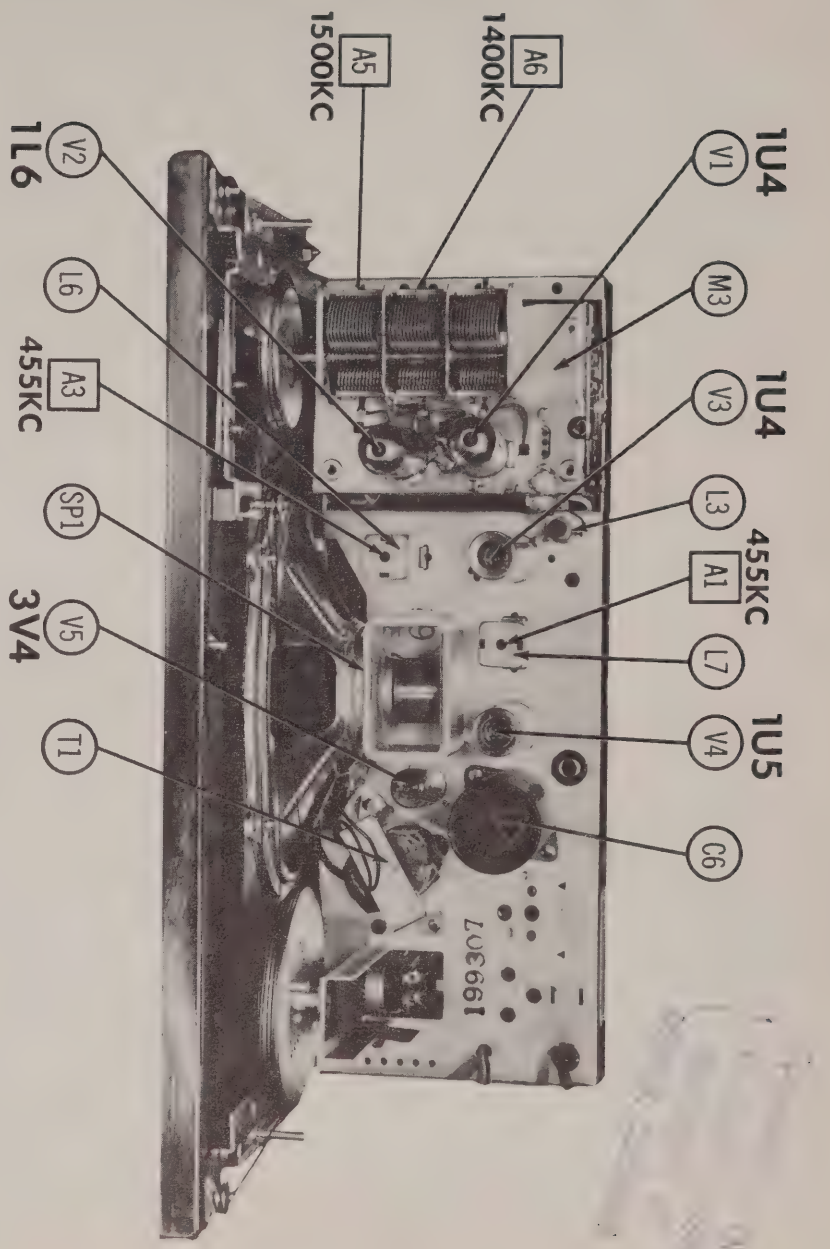
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6A	▬80	150	45B215	AFH4-38		DO 33		FP411	R1360	
B	■40	150								
C	▲40	150								
D	80	25								
C7	100	25	45A214	PRS25/100		BRH251A		TC2501	TVA-1207	
C8	22			BPD-000022	D6-220		GP1K-220	UC-5422	5GA-Q22	
C9	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C10	270			BPD-00027	D6-271		GP2K-271	UC-5327	5GA-T27	
C11	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C12	270			BPD-00027	D6-271		GP2K-271	UC-5327	5GA-T27	
C13	270			BPD-00027	D6-271		GP2K-271	UC-5327	5GA-T27	
C14	270			BPD-00027	D6-271		GP2K-271	UC-5327	5GA-T27	
C15	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	Note 1
C17	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C18	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C19	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C20	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C21	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C22	.047	200	46BS473L2	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C23	.047	200	46BS473L2	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C24	.01	400	46BS103L4	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C25A	50		♦49A023	SI50	♦PC-52	TM5Q5	♦1403-03	UC-545	♦100C3	
B	50			SI50		TM5Q5		UC-545		
C26	10000		47A217	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C27	10000		47A217	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C28A	100		†49A024	SI100	†PC-91	TM5T1	†1407-03	UC-531	†103C3	
B	.005			BPD-005		TM5D5		DC-525		
C	.005			BPD-005		TM5D5		DC-525		
C29	220	500	47X20B221K	1468-00025	D6-221	5W5Q25	GP2K-221	MC240	1FM-325	
C30	.005	600	46BS472L6	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C31	.022	200	46BS223L2	P488-022		PTE4S22		PT4122	4TM-S22	
C32	.022	200	46BS223L2	P488-022		PTE4S22		PT4122	4TM-S22	
C33	.001	600	46BS102L6	P688-001	D6-102	PTE6D1	GP2-333-102	PT621	6TM-D1	
C34	.047	400	46BR473L6	489ZX-05		PJ4S47		PT4147	4TM-S47	
C35	.047	400	46BS473L4	489ZX-05		PJ4S47		PT4147	4TM-S47	

Note 1. Some Models use .02MFD in this application.
♦ Items C25A, C25B and R15 are combined in one unit.
† Items C28A, C28B, C28C, R19A, R19B, R19C are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	25B1009	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	1Meg	1/2		BTS-1Meg	
R3	82Ω	1/2		BTS-82	
R4	15KΩ	1/2		BTS-15K	
R5	3.9Meg	1/2		BTS-3.9Meg	
R6	1Meg	1/2		BTS-1Meg	
R7	180KΩ 5%	1/2		BTS-180K 5%	
R8	18KΩ	1/2		BTS-18K	
R9	68KΩ	1/2		BTS-68K	
R10	1000Ω	1/2		BTS-1000	
R11	10KΩ	1/2		BTS-10K	
R12	120Ω	1/2		BTS-120	
R13	2.7Meg	1/2	23X20X275K	BTS-2.7Meg	
R14	2.2Meg	1/2	23X20X225K	BTS-2.2Meg	
R15	47KΩ	1/2	♦49A203	BTS-47K	
R16	1.2Meg	1/2	23X20X125K	BTS-1.2Meg	Note
R17	1500Ω	1/2	23X20X152K	BTS-1500	
R18	10Meg	1/2	23X20X106K	BTS-10Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R19A	4.7Meg	1/2	†49A024	BTS-4.7Meg	
B	1Meg	1/2		BTS-1Meg	
C	2.2Meg	1/2		BTS-2.2Meg	
R20	100KΩ	1/2	23X20X104K	BTS-100K	
R21	18KΩ	1/2	23X20X183K	BTS-18K	
R22	27KΩ	1/2	23X20X273K	BTS-27K	
R23	1000Ω	1/2	23X20X102K	BTS-1000	
R24	82Ω	2	23X40X820J		
R25	2000Ω	10	24A959	1 3/4A-2000	
R26	3300Ω 5%	1/2	23X20X332J	BTS-3300 5%	
R27	680Ω 5%	1/2	23X20X680J	BTS-68 5%	
R28	100Ω 5%	1/2	23X20X101J	BTS-100 5%	
R29	220Ω 5%	1/2	23X20X221J	BTS-220 5%	
R30	1500Ω 5%	1/2	23X20X152J	BTS-1500 5%	
R31	1000Ω	1/2	23X20X102K	BTS-1000	
R32	1000Ω	1/2	23X20X102K	BTS-1000	
R33	330KΩ	1/2		BTS-330K	

Note : Some Models may use a 1Meg resistor in this application.
♦ Items R15, C25A, C25B are combined in one unit.
† Items R19A, R19B, R19C, C28A, C28B, C28C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA Hallicrafters PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	9.7KΩ	3.5Ω	288Ω	.61Ω SEC.2 14.6Ω	55C198					

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA Hallicrafters PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	5 x 7"	PM	3.5Ω	85C130	57J9	57A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	BC Loop Ant.	1.2Ω		57C169				
L2	Loop Ant.	.4Ω		57C170				Remote Ant. (Includes cable and plug)
L3	Ant. Loading Coil	2.8Ω		51B1586				
L4	Fil. Choke	5Ω		53A265			4662	1.1 Microhenries
L5	Fil. Choke	5Ω		53A265			4662	1.1 Microhenries
L6	Input IF	15Ω	14.5Ω	50C242	16-6758	BC-352	12-C1	
L7	Output IF	15Ω	14.5Ω	50C242	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA Hallicrafters PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.068ADC	27A161	NC5	5M1	1004A	6S100	100

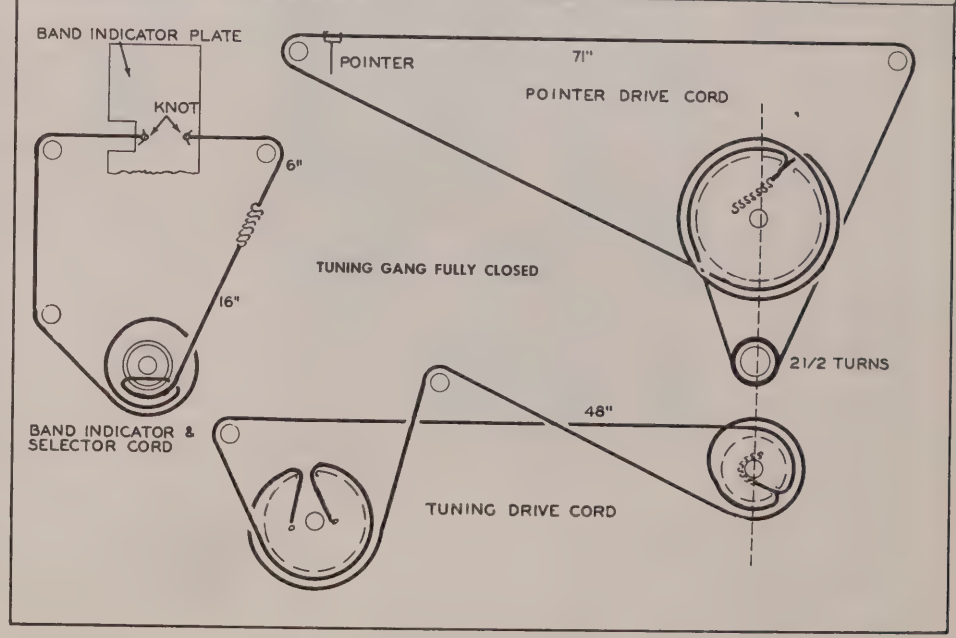
CHASSIS—BOTTOM VIEW

BATTERIES

ITEM No.	VOLTAGE	Hallicrafters PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	9V "A" 90V "B"	P999			752			G6B60	

MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M3	RF Tuner	1P1382	Complete with tubes (Tuning gang -18-462MMF each section)
M4	Switch	60A503	Tone (Assembly of 4 SPDT slide)
M5	Switch	60B504	AC/DC Battery Change-over
M6	Phone Jack	36A002	
	Cabinet	7AF904	
	Dial Scale	83D425	
	Dial Glass	22B369	
	Escutcheon Dial	7D386	
	Escutcheon Tone Control	7C389	
	Knob	15C532	Off/On/Volume
	Knob	15C533	Band Selector
	Knob	15C534	Tuning
	Pointer Dial	82B223	

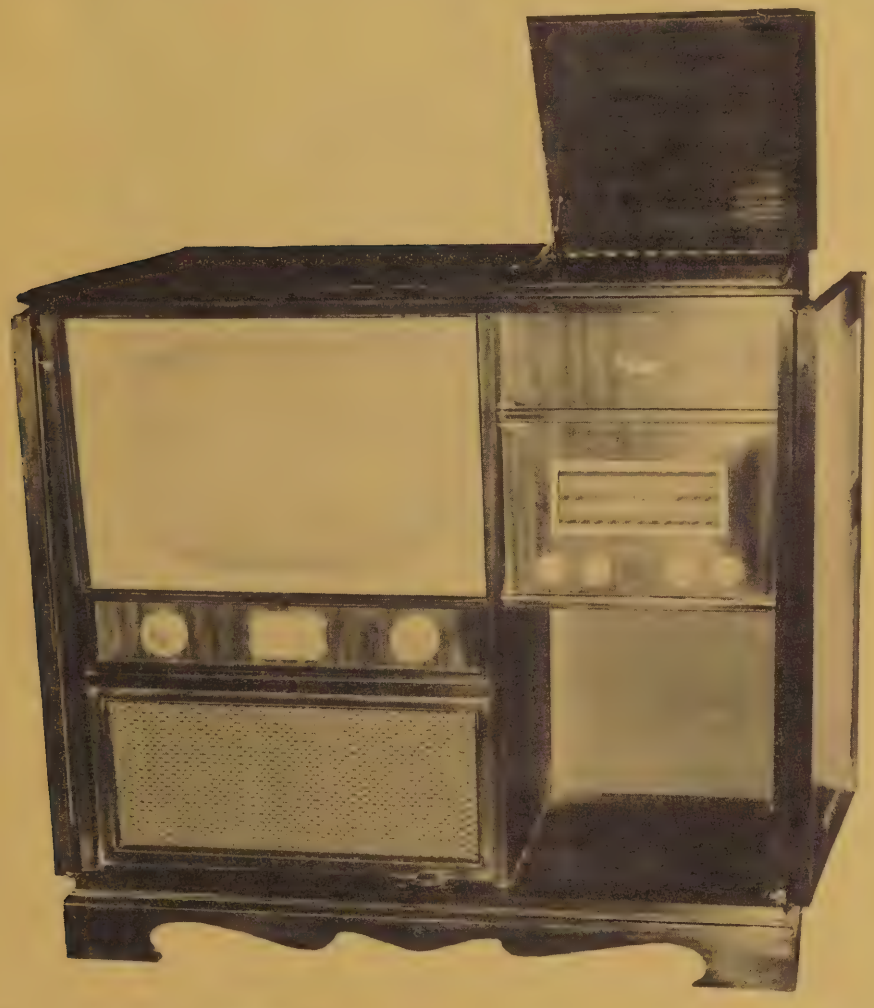


DIAL CORD DRIVE

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



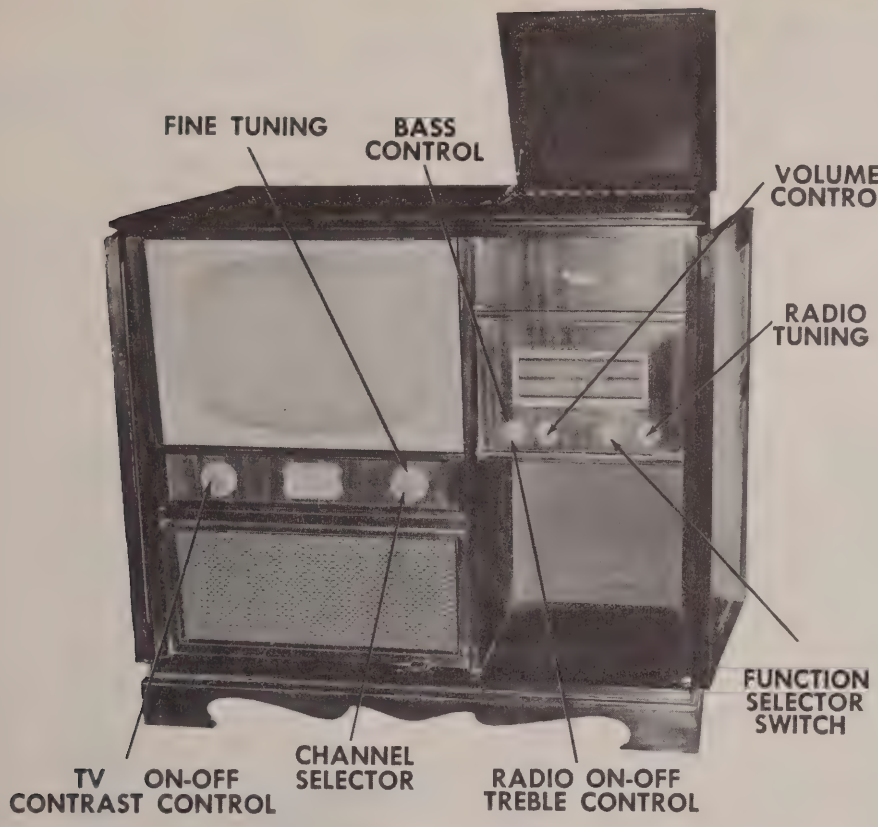
MODEL 21M906

HOFFMAN
MODELS 21B907, 21M906, 21P908

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

HOFFMAN
MODELS 21B907, 21M906, 21P908



PROPERTY OF

HOFFMAN
MODELS 21B907, 21M906, 21P908

HOFFMAN MODEL 21M906 (Ch.199T)

TRADE NAME	Hoffman Models 21B907, 21M906, 21P908 (TV Ch.199M, T, Radio Ch. 182B)
MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.
TYPE SET	TV-AM-FM-Phono Combination Receiver
TUBES	Thirty-four
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.83 Amp. @ 117 Volts
TUNING RANGE	TV Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) FM Radio 87-109MC, FM IF 10.7MC, AM Radio 535-1620KC, AM IF 455KC

INDEX

Alignment Instructions 5, 6, 7
Drive Cord Stringing (Radio) 20
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 13
Parts List and Descriptions ..... 21 thru 26
Photographs
- Cabinet-Rear View 13
- Capacitor Identification (TV) 4, 9
- Chassis -Bottom View (Radio) 16
- Chassis-Top View (Radio) 20
- Chassis-Top View (TV) 3
- RF Tuner 8
- Resistor Identification (TV) 27, 28
- Trans., Inductor and Alignment Identification 19

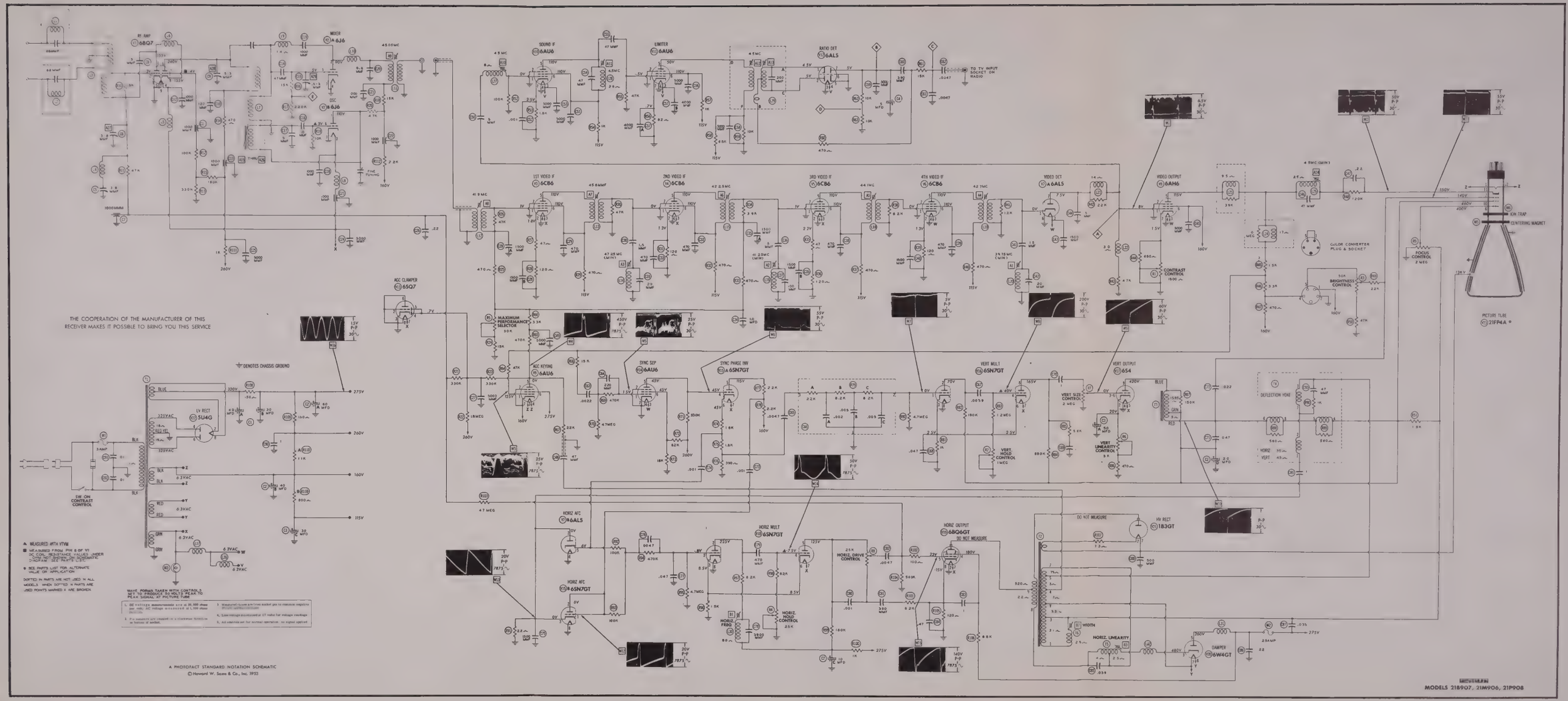
Resistance Measurements 11
Servicing in the Field 18
Schematic (Radio) 14, 15
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 10
Tube Placement Chart (Bottom View) 11
Tube Placement Chart (Top View) 10

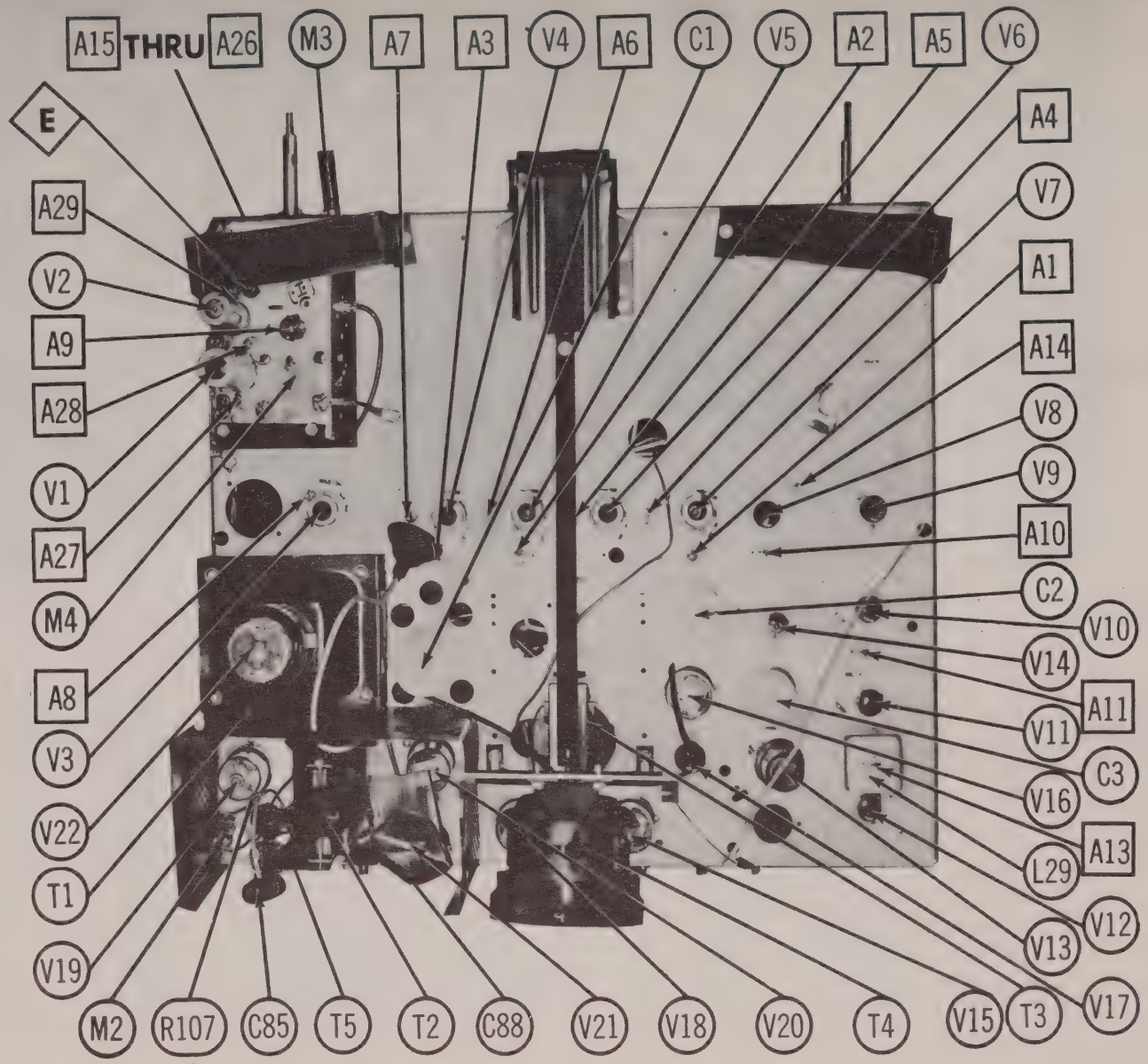
WEBSTER-CHICAGO RECORD CHANGER MODEL 114.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 11-53 SET 221 FOLDER 6


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953
MODELS 21B907, 21M906, 21P908
MODELS 21B907, 21M906, 21P908



TV CHASSIS TOP VIEW

MODELS 21B907, 21M906, 21P908

HOFFMAN

L.I. ... SHIP
... COLORADO

PROPERTY OF
L. F [illegible] SHIP
3[illegible] ST
DE[illegible]

TV CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

HOFFMAN

MODELS 218907, 218906, 218908

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube (V19). Turn Radio-TV-Phono switch to "TV" position.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C34. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	39.75MC (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	41.25MC	"	"	A2	"
3.	"	"	47.25MC	"	"	A3	"
4.	"	"	42.7MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	44.1MC	"	"	A5	"
6.	"	"	42.25MC	"	"	A6	"
7.	"	"	45.6MC	"	"	A7	"
8.	"	"	41.9MC	"	"	A8, A9	Adjust A9 counter clockwise for MINIMUM at 41.9MC. Adjust A8 for maximum deflection. If A8 and A9 are both near maximum response at 41.9MC oscillations may occur preventing proper setting of A8.
9.	"	"	45.05MC	"	"	A9	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp)	39.75MC 42.25MC 45.6MC 45.75MC 47.25MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response similar to Fig.1. If necessary retouch A4 thru A9 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
12.	"	"	"	"	DC probe to point (C). Common to point (D).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with a 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.001MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A10, A11 A12	Disconnect stabilizer capacitor, C4. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
12.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A13	Reconnect capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3 . SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum contrast.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (Fig.4) to pin 11 of picture tube. Common to chassis.	A14	Temporarily detune L27 by touching terminal with screw driver shaft held in the fingers, while at the same time adjusting A14, for MINIMUM deflection on VTVM.

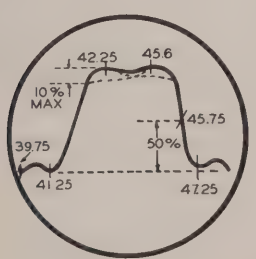


FIG. 1

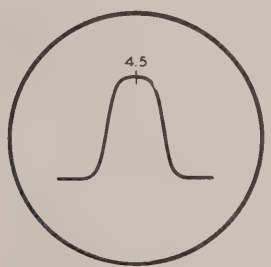


FIG. 2

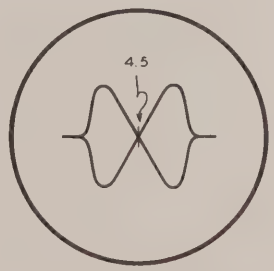


FIG. 3

PROPERTY OF

TV ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the bias battery as under Video IF Alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (0MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A15	Adjust to place sound marker in sound trap notch as in Fig. 5. Video marker should be at 50% response.
			207MC (0MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (0MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (0MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (0MC Swp)	187.25MC 191.75MC	9		A19	
			183MC (0MC Swp)	181.25MC 185.25MC	8		A20	
			177MC (0MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (0MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (0MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (0MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (0MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (0MC Swp)	55.25MC 59.75MC	2		A26	

RF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (0MC Swp)	205.25MC 209.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A27, A28, A29	Adjust for maximum response similar to Fig. 6.
16.	"	"	213MC (0MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make compromise adjustments of A27, A28 and A29 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (0MC Swp)	199.25MC 203.75MC	11			
			195MC (0MC Swp)	193.25MC 197.75MC	10			
			189MC (0MC Swp)	187.25MC 191.75MC	9			
			183MC (0MC Swp)	181.25MC 185.75MC	8			
			177MC (0MC Swp)	175.25MC 179.75MC	7			
			85MC (0MC Swp)	83.25MC 87.75MC	6			
			79MC (0MC Swp)	77.25MC 81.75MC	5			
			69MC (0MC Swp)	67.25MC 71.75MC	4			
			63MC (0MC Swp)	61.25MC 65.75MC	3			
			57MC (0MC Swp)	55.25MC 59.75MC	2			

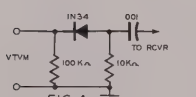


FIG. 4

FIG. 5

FIG. 6

FIG. 7

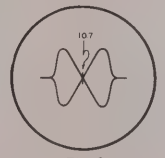


FIG. 8

RADIO ALIGNMENT INSTRUCTIONS

F. B.
3924 MEADE ST.
DENVER, COLORADO

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
Set treble and bass controls to maximum position. If two peaks occur the proper tuning point is the one where the core is farthest out of the coil.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
17.	.1MFD	High side to pin 1 (grid) of 6BA6 (V28). Low side to chassis.	455KC (400%Mod.)	AM	Tuning gang fully closed	Across voice coil	A30, A31	Adjust for maximum deflection.
18.	"	High side to pin 1 (grid) of 6BA6 (V27). Low side to chassis.	"	"	"	"	A32, A33	"
19.	"	High side to pin 1 (grid) of 6BE6 (V26). Low side to chassis.	"	"	"	"	A34, A35	"
20.	"	High side to pin 1 (grid) of 6BA6 (V25). Low side to chassis.	1620KC	"	Tuning gang fully open	"	A36	Adjust for maximum deflection If range is insufficient adjust capacitor on opposite side of stator plates.
21	"	"	600KC	"	Tune to 600KC signal	"	A37	"
22.	"	"	1400KC	"	Tune to 1400KC signal	"	A38	"
23.	Repeat steps 21 and 22 as necessary.							
24.	Connect the DC probe of a VTVM to pin 4 (diode plate) of 6SQ7 (V30) and tune in an AM station near 1400KC. Adjust A39 for maximum deflection.							

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±2%) resistors in series from point (D) to chassis. The junction of these two resistors is alignment point (E) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
25.	.005MFD ceramic capacitor	High side to pin 1 (grid) of 6BA6 (V36). Low side to chassis.	10.7MC (400%Mod)	FM	Tuning gang fully closed	Across Voice Coil	A40, A41	Adjust for maximum deflection.
26.	"	High side to pin 1 (grid) of 6BA6 (V37) . Low side to chassis.	"	"	"	"	A42, A43	"
27.	"	High side to pin 2 (grid) of 12AT7 (V24). Low side to chassis,	"	"	"	"	A44, A45	"
28.	"	"	10.7MC (Unmod)	"	"	DC probe to point (G). Common to point (E).	A41	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

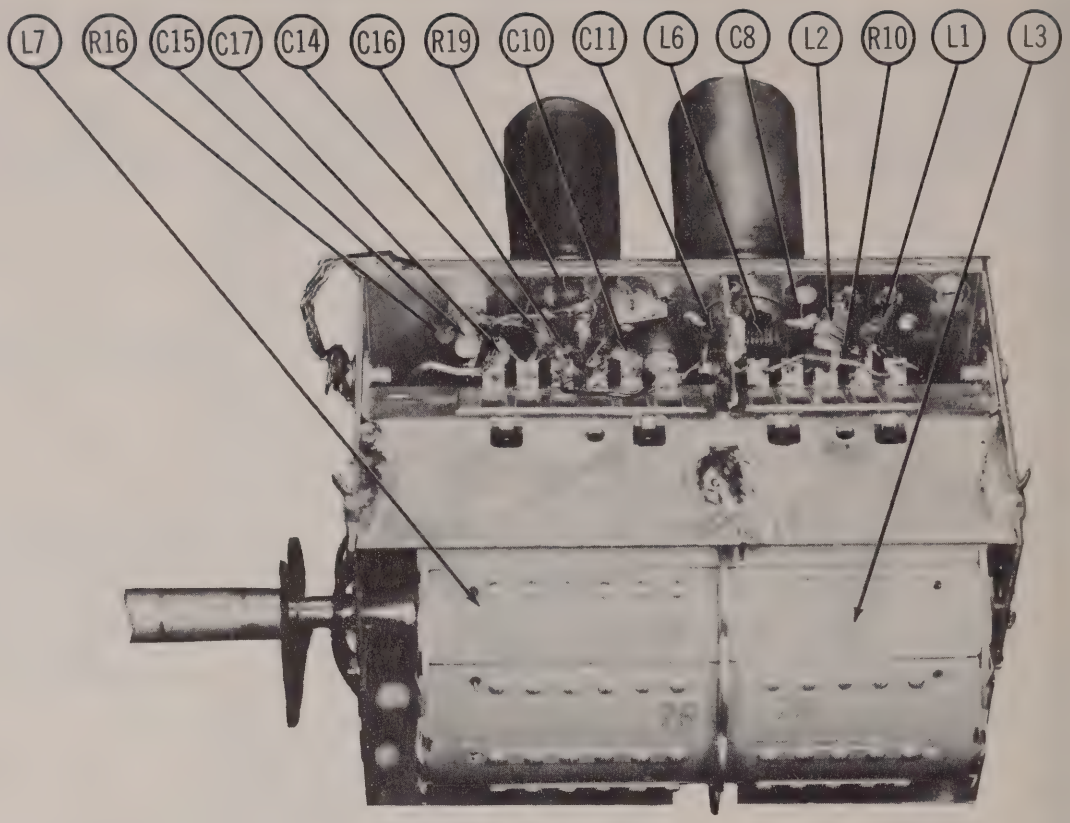
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
25.	.005MFD Ceramic Capacitor	High side to pin 2 (grid) of 12AT7 (V24). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully closed	Vert. Amp. to point (F). Low side to chassis.	A40, A42, A43, A44, A45	Disconnect stabiliser capacitor C97. Adjust for maximum amplitude and symmetry similar to Fig. 7. Reconnect stabiliser capacitor C97.
26.	"	"	"	"	"	Vert. Amp. to point (G). Low side to chassis.	A41	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 8. SLIGHTLY retouch A40 for maximum amplitude and straightness of crossover lines.
	NOTE: Continue alignment with step 29.							

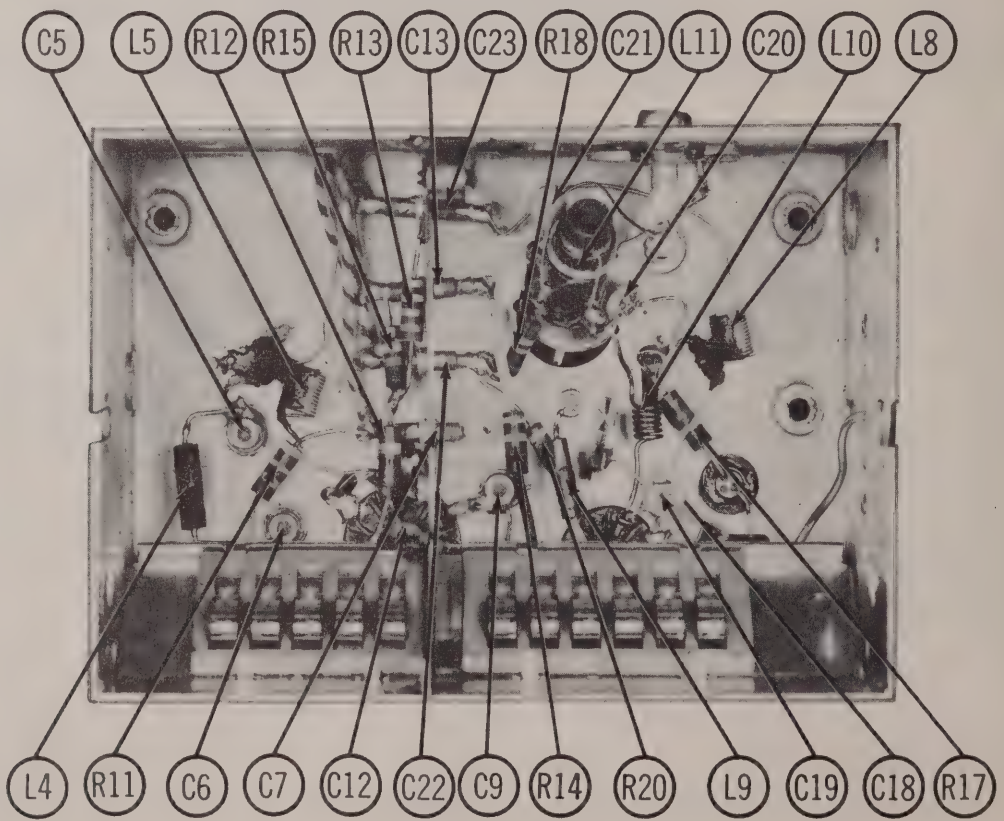
FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
29.	220Ω Carbon resistor	Across FM antenna terminals with 220Ω in hot lead.	109MC (400%Mod)	FM	Tuning gang fully open	Across voice coil	A46	Adjust for maximum deflection.
30.	"	"	87MC (400%Mod)	"	Tuning gang fully closed	"	L37	Compress or expand coil turns for maximum deflection.
31.	Repeat steps 29 and 30 until frequencies fall at their proper ends of dial.							
32.	220Ω Carbon Resistor	Across FM Antenna terminals with 220Ω in hot lead.	107MC (400%Mod)	FM	Tune to 107MC signal	Across voice coil	A47	Adjust for maximum deflection.
33.	"	"	90MC (400%Mod)	FM	Tune to 90MC signal	"	L36	Compress or expand coil turns for maximum deflection.
34.	Repeat steps 29, 30, 32 and 33.							
35.	Replace chassis bottom cover. Retouch A46 for maximum deflection as in Step 29.							

HOFFMAN
MODELS 21B907, 21M906, 21P908

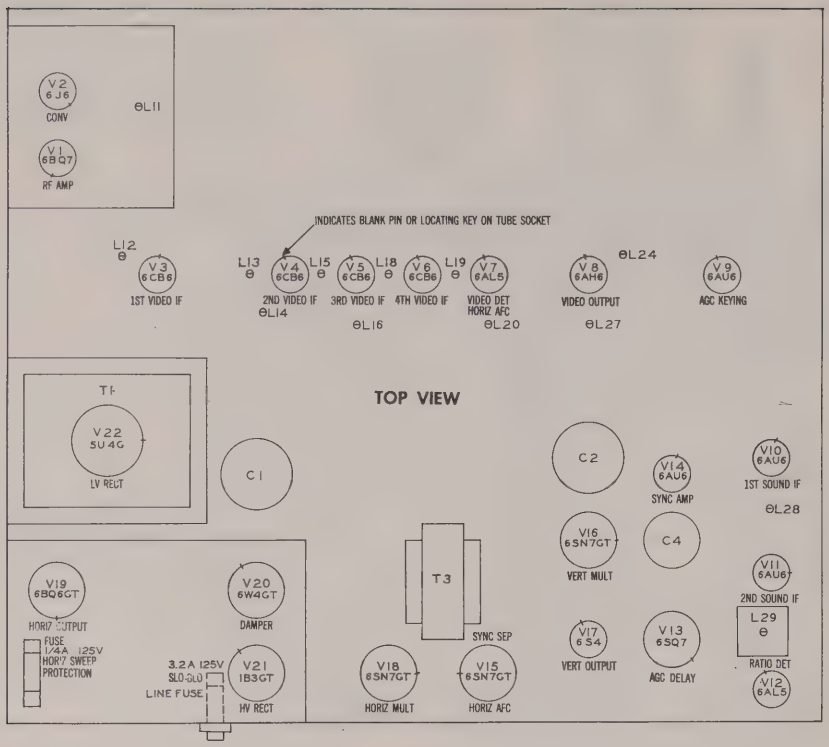


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V22, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V7**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V8, V23**
Has pic, no sound - **V10, V11, V12, V30, V31, V32, V33**
Overloaded picture - **V9, V13**

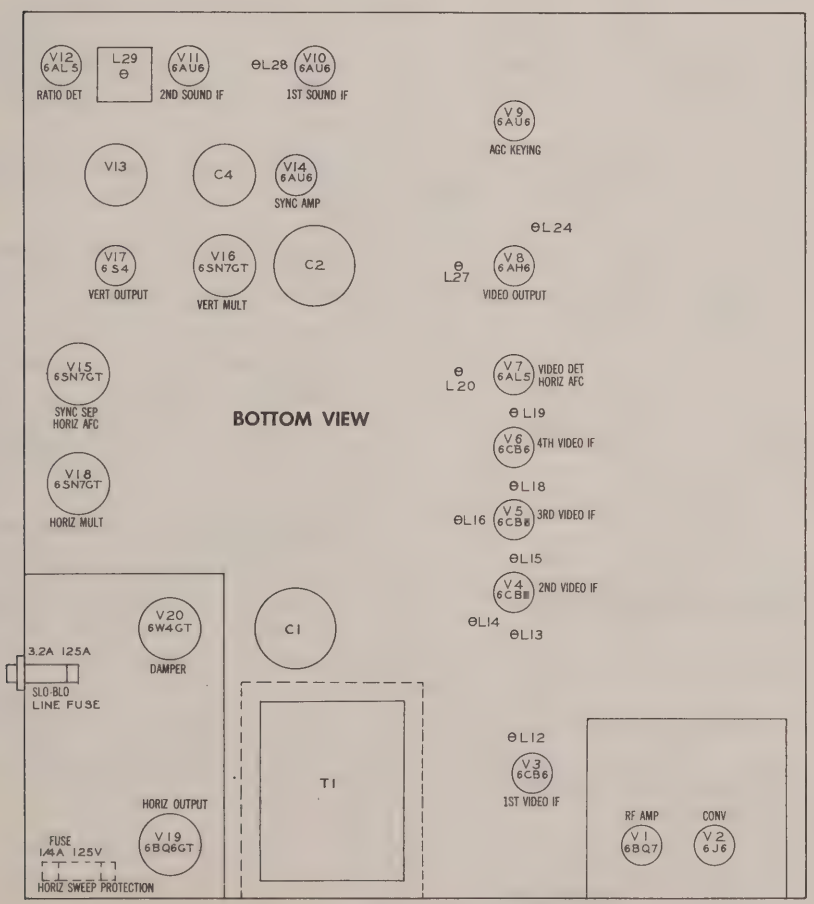
SYNC FAILURE
No vert. sync - **V15, V16, V17**
No horiz. sync - **V7, V15, V18**
No vert. or horiz. sync - **V14, V15**

SWEEP FAILURE
No raster, has sound - **V18, V19, V20, V21, V23, Fuse (M2)**
No vertical deflection - **V16, V17**
Poor vert. linearity or foldover - **V16, V17**
Poor horiz. linearity or foldover - **V18, V19, V20**
Narrow picture - **V18, V19, V20, V21, V22**
Vert. off freq. - **V15, V16, V17**
Horiz. off freq. - **V7, V15, V18**

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	820KΩ	0Ω	.1Ω	0Ω	†1.7KΩ	210KΩ	INF	0Ω
V 2	6J6	†8KΩ	†19KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	60KΩ	170Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 4	6CB6	.1Ω	120Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 5	6CB6	60KΩ	170Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 6	6CB6	.1Ω	120Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 7	6AL5	.1Ω	22Ω	.1Ω	0Ω	5Meg	0Ω	4.7KΩ		
V 8	6AH6	4.7KΩ	0Ω	.1Ω	0Ω	†5.5KΩ	†1.5KΩ	130Ω		
V 9	6AU6	†50KΩ	†1.5KΩ	†1.5KΩ	†1.5KΩ	400KΩ	†150Ω	†1.5KΩ		
V 10	6AU6	100KΩ	0Ω	.1Ω	0Ω	†3KΩ	†3KΩ	1.8KΩ		
V 11	6AU6	47KΩ	0Ω	.1Ω	0Ω	†8KΩ	†3KΩ	82Ω		
V 12	6AL5	INF	INF	0Ω	.1Ω	0Ω	0Ω	20KΩ		
V 13	6SQ7	0Ω	0Ω	0Ω	500KΩ	500KΩ	0Ω	.1Ω	0Ω	
V 14	6AU6	5Meg	0Ω	.1Ω	0Ω	†330KΩ	†25KΩ	0Ω		
V 15	6SN7GT	5Meg	5Meg	22Ω	†330KΩ	† 5.8KΩ	4KΩ	.1Ω	0Ω	
V 16	6SN7GT	4.7Meg	♦180KΩ	1KΩ	1.4Meg	♦680KΩ	1KΩ	.1Ω	0Ω	
V 17	6S4	INF	1.7KΩ	1.1Meg	0Ω	.1Ω	1.1Meg	INF	INF	♦2KΩ
V 18	6SN7GT	4.7Meg	†9.5KΩ	1.5KΩ	95KΩ	†180KΩ	1.5KΩ	.1Ω	0Ω	
V 19	6BQ6GT	120Ω	.1Ω	560KΩ	†7KΩ	560KΩ	750KΩ	0Ω	120Ω	TOP CAP ♦28Ω
V 20	6W4GT	320KΩ	420KΩ	320KΩ	INF	†150Ω	INF	300KΩ	300KΩ	
V 21	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ♦550Ω
V 22	5U4GT	INF	12KΩ	INF	18Ω	INF	19Ω	INF	12KΩ	
V 23	21FP4A	†1.4KΩ	†25KΩ	PIN 6 450KΩ	PIN 10 ♦1.5KΩ	PIN 11 †125KΩ	PIN 12 †1.4KΩ			

♦ MEASURED FROM PIN 3 OF V20
† MEASURED FROM PIN 8 OF V22



TUBE PLACEMENT CHART

SET 221 FOLDER 6

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V18, V19, V20 and V22. Check adjustment of horiz. drive control, B2 and B3. Check waveform at W15.

If Satisfactory	If Unsatisfactory
Check C83, C85, C86, T2, T4A, R106 and other associated components.	Check C80, C81, C82, R8 , R99, R104 and other associated components.

DRIVE LINES

Check horiz. drive control adjustment. Check by substitution V18, V19 and V20. Check C80, C81, C82, C85, C86, T2, T4A and other associated components.

COMPRESSED LEFT SIDE

Substitute V20. Check T2, T4A and damper circuit components.

FOLDS ON RIGHT SIDE

Substitute V18 and V19. Check T2, T4A, C83, R106 and other components associated with the horizontal output stage.

XMAS TREE EFFECT

Substitute V18. Check L30, C78, C79 and other components associated with V18.

VERTICAL

LOSS OF SWEEP

Check by substitution V16 and V17. Check waveform at W9.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R51, R86, R6 and other associated components.	Check R7, R84, R81, R82, C67, C70 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of Vert. size and vert. linearity controls. Check by substitution V16 and V17. Follow procedure outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V16 and V17. Check C70, R84, R7, T3, T4B and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V16 and V17. Check C3A, T3 and T4B. Check other associated components.

FOLDS

Check by substitution V16 and V17. Check components associated with these stages.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V7, V15 and V18. Check waveform at W13.

If Satisfactory	If Unsatisfactory
Check R92, R93, C73, C74 and other associated components. Check components associated with V18.	Check C75, R91 and other associated components.

CRITICAL HOLD

Check by substitution V7, V15 and V18. Check adjustment of B1. Follow procedure outlined under "Loss of Sync".

PIE CRUST EFFECT

Substitute V18. Check C77 for open.

VERTICAL

LOSS OF SYNC

Check by substitution V14, V15, V16, V7 and V8. Check waveform at W7.

If Satisfactory	If Unsatisfactory
Check C67, C68, R81, R82, R83, R84 and other associated components.	Check the vert. integrator network, all coupling and bypass capacitors and other associated components.

CRITICAL HOLD

Check by substitution V16, V15, V14, V8 and V7. Follow procedure outlined under "Loss of Sync".

TRIGGERING

Check by substitution V16, V15 and V14. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Substitute V8. Check components associated with this stage. Check picture tube and other associated components.

SOUND BARS (4.5 MC BEAT)

Check adjustment of Local oscillator in RF tuner. Check adjustment of A14 and A10. Check video IF alignment.

NEGATIVE PIX

Check by substitution V7, V8 and V9. Check adjustment of Maximum Performance Selector. Check components associated with V7, V8 and V9. Check picture tube.

POOR CONTRAST

Check by substitution V7 and V8. Check contrast control picture tube and other associated components. Check video IF alignment.

SMEAR

Check by substitution V7 and V8. Check C44 and C47. Check L21, L23 and L24. Check R44, R45 and R46 for change of value. Check picture tube and other associated components.

ONE WIDE BLACK BAR ACROSS PIX

Check RF tuner, video IF, video detector and video amplifier tubes for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11 and V12 on TV chassis. Check by substitution V30, V31, V32, V33 and V34 on radio chassis. Check stages of V30, V31, V32, V33 and V34 by switching to AM Radio position.

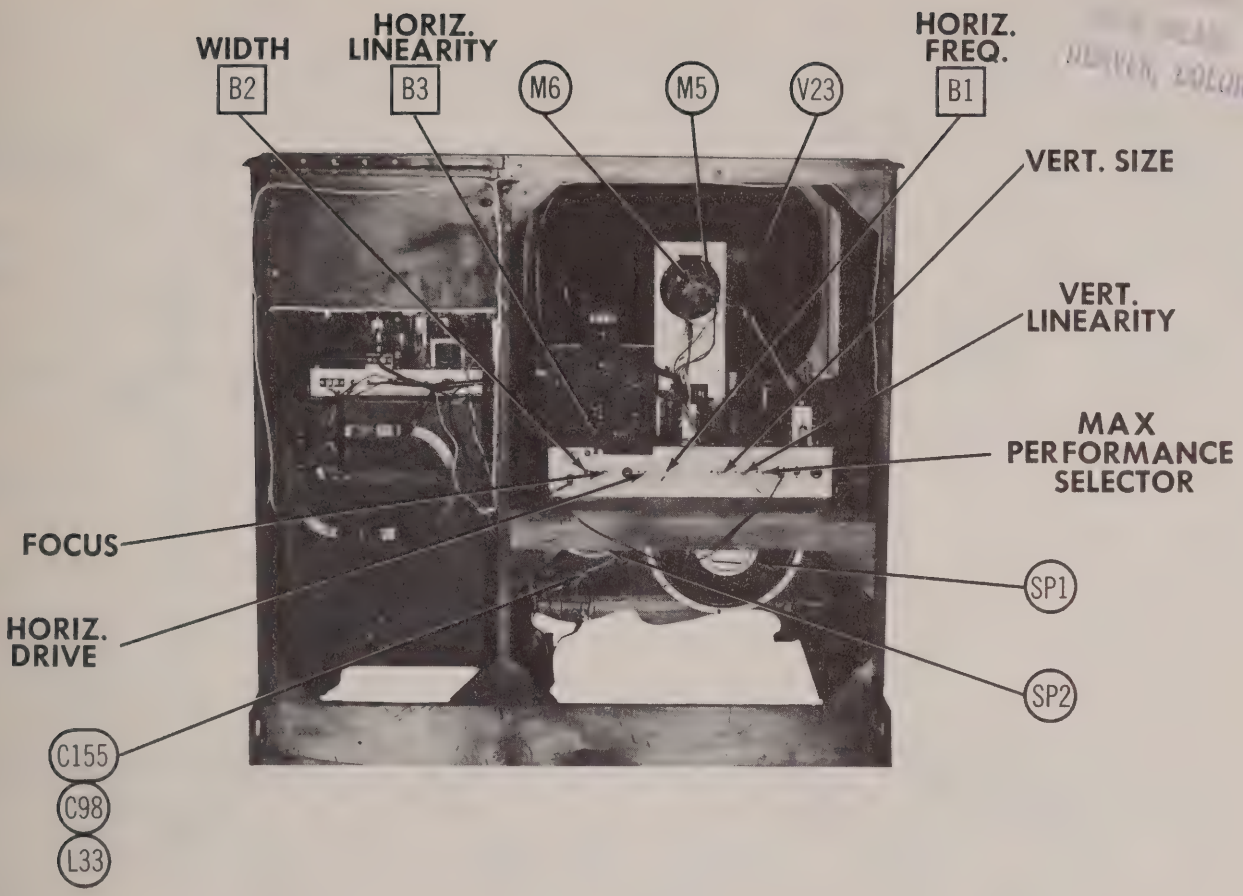
If Satisfactory	If Unsatisfactory
Check ratio detector and sound IF alignment on TV chassis. Check associated circuit components.	Check associated circuit components especially all coupling and bypass capacitors.

BUZZ

Substitute V12. Check ratio detector alignment and components.

DISTORTED

Follow procedure outlined under "Weak or No Sound".



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold control for horizontal synchronization without bending of vertical lines near the top of the picture.

If unable to obtain satisfactory horizontal synchronization by means of the horizontal hold control adjust the horizontal frequency slug (B1).

Turn B1 counter clockwise while turning the channel selector on and off channel until sync is lost. Turn B1 clockwise and note the number of diagonal bars just before sync pull in.

There should be not less than 2 bars.

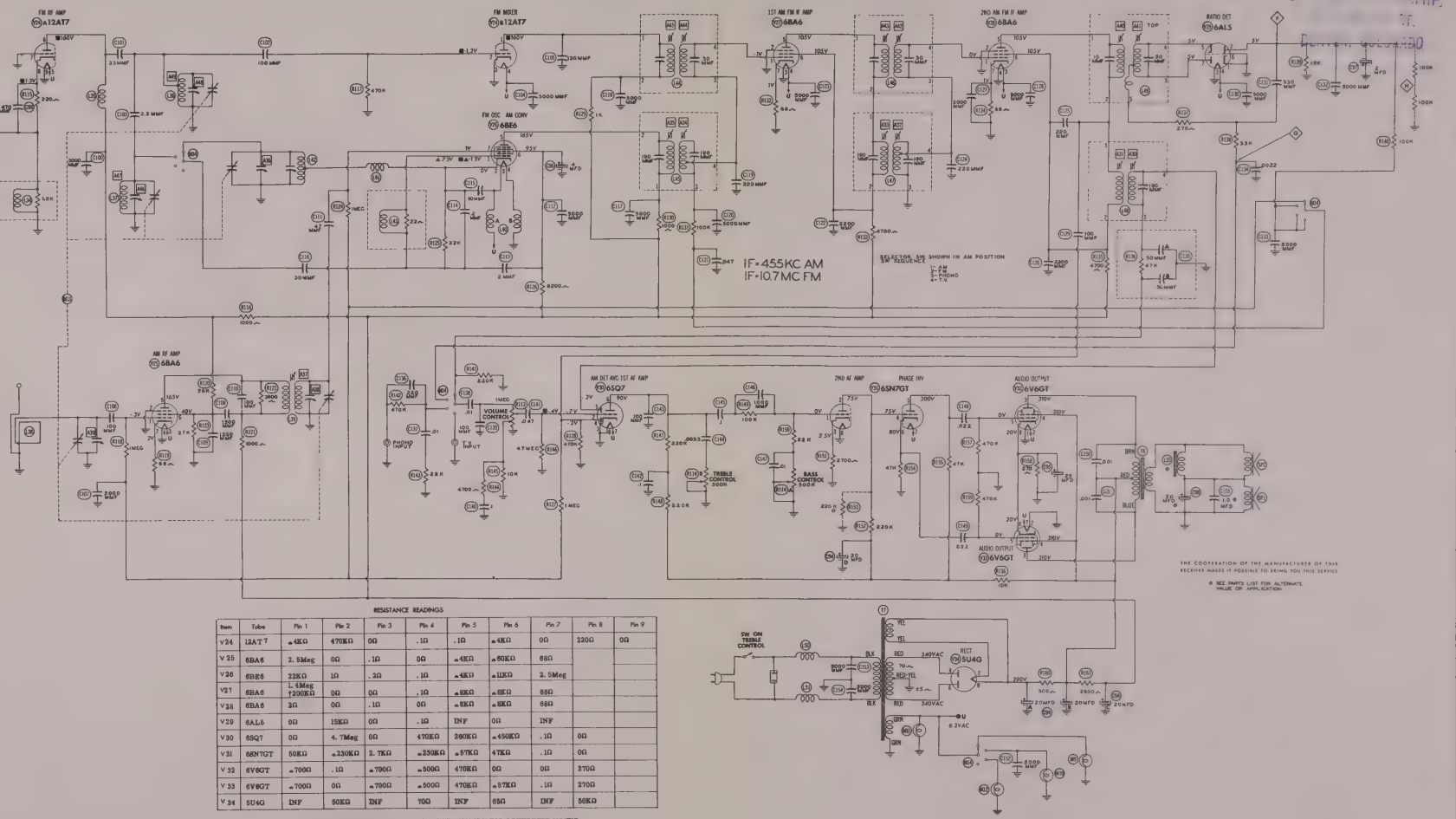
Continue turning B1 until sync is lost again, then turn B1 counter clockwise and note the point where sync pull in occurs.

Turn B1 an additional $\frac{1}{2}$ turn counter clockwise.

Adjust the horizontal drive control counter clockwise as far as possible without the presence of a vertical white bar in the picture.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 24	12AT 7	▲4KΩ	470KΩ	0Ω	.1Ω	.1Ω	▲4KΩ	0Ω	220Ω	0Ω
V 25	6BA6	2. 5Meg	0Ω	.1Ω	0Ω	▲4KΩ	▲60KΩ	68Ω		
V 26	6BE6	22KΩ	1Ω	.2Ω	.1Ω	▲4KΩ	▲11KΩ	2. 5Meg		
V 27	6BA6	1. 4Meg †200KΩ	0Ω	0Ω	.1Ω	▲8KΩ	▲8KΩ	68Ω		
V 28	6BA6	2Ω	0Ω	.1Ω	0Ω	▲8KΩ	▲8KΩ	68Ω		
V 29	6AL5	0Ω	15KΩ	0Ω	.1Ω	INF	0Ω	INF		
V 30	6SQ7	0Ω	4. 7Meg	0Ω	470KΩ	260KΩ	▲450KΩ	.1Ω	0Ω	
V 31	6SN7GT	50KΩ	▲230KΩ	2. 7KΩ	▲230KΩ	▲97KΩ	47KΩ	.1Ω	0Ω	
V 32	6V6GT	▲700Ω	.1Ω	▲700Ω	▲500Ω	470KΩ	0Ω	0Ω	270Ω	
V 33	6V6GT	▲700Ω	0Ω	▲700Ω	▲500Ω	470KΩ	▲97KΩ	.1Ω	270Ω	
V 34	5U4G	INF	50KΩ	INF	70Ω	INF	65Ω	INF	50KΩ	

ALL MEASUREMENTS TAKEN IN AM POSITION UNLESS OTHERWISE NOTED.
▲ MEASURED FROM PIN 8 OF V34.
† MEASURED WITH M14 IN FM POSITION
▪ TAKEN WITH VACUUM TUBE VOLTMETER
● MEASURED IN FM POSITION

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

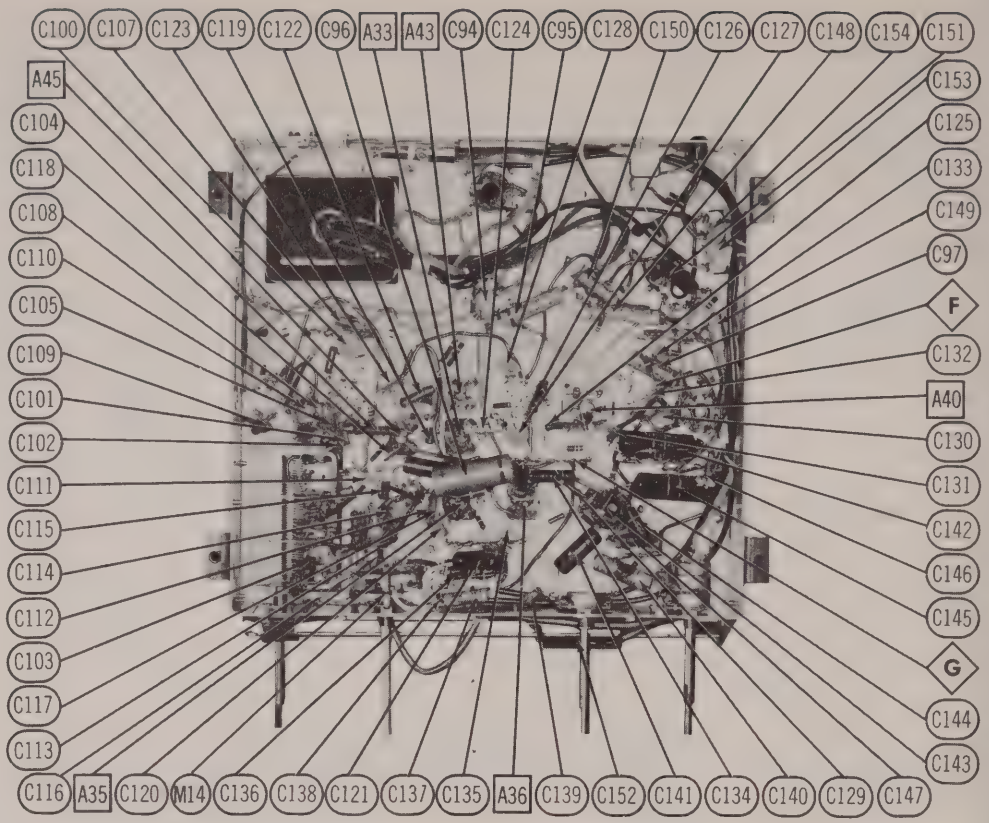
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W Sams & Co., Inc. 1953

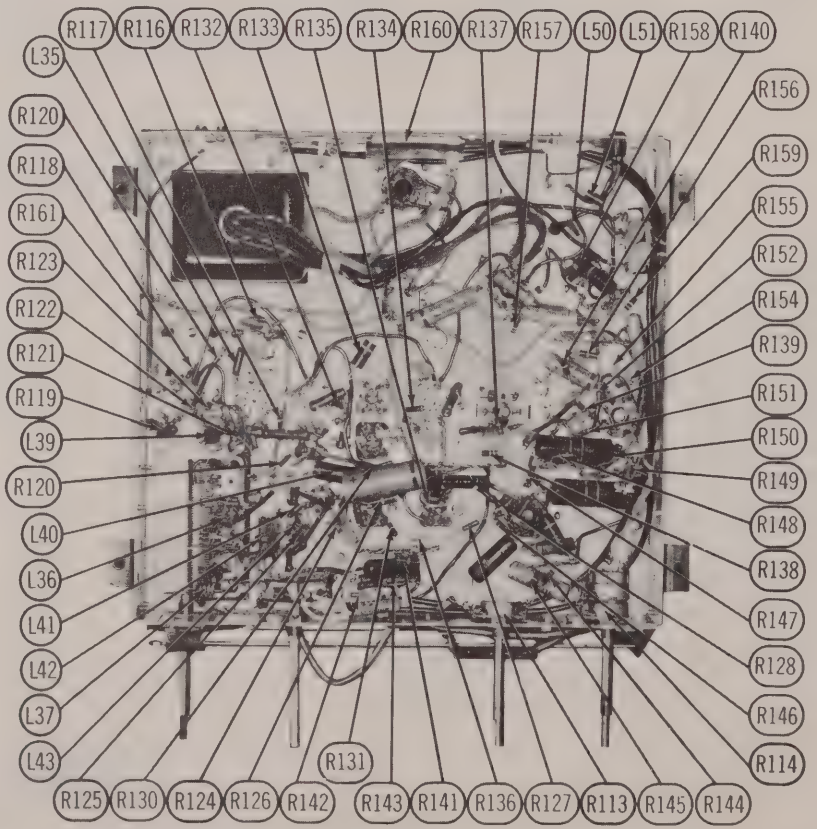
HOFFMAN
MODELS 21B907, 21M906, 21P908

RADIO SCHEMATIC

HOFFMAN
MODELS 21B907, 21M906, 21P908



RADIO CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



RADIO CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

POWER

DEAD SET

Check Fuse M1. Check switch on volume control, AC interlock assembly and T1.

SMALL AND/OR DIM RASTER

Substitute V22. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M2. Check by substitution V18, V19, V20 and V21. Check waveform at W15.

If Satisfactory	If Unsatisfactory
Check C88, R107, T2, T4A and other associated circuit components.	Check R101, R104, C80, C81, C82, R8 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V18, V19, V20, V21 and V22. Follow procedure outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V21, V20, V19, V18 and V22. Check R107, C88, T2, T4A and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check associated circuit components.

NO RASTER NO SOUND

See "Dead Set".

TOTAL LOSS OF SYNC

Substitute V14 and V15. Check associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

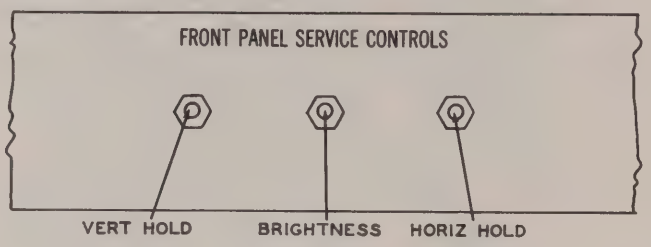
PICTURE TUBE SAFETY GLASS CLEANING

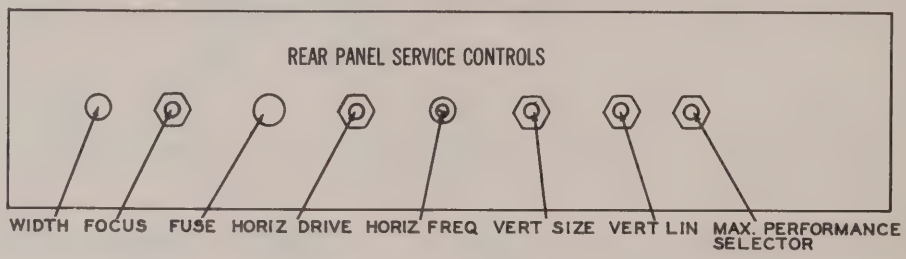
To clean safety glass remove 3 wood screws holding wood strip at top of cabinet. Remove wood strip and safety glass. (Use extreme caution when removing safety glass).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





SPECIAL ADJUSTMENTS - MAXIMUM PERFORMANCE SELECTOR

Adjust the control for best picture quality on a strong TV signal.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L29) located on top of chassis. (See tube placement chart).

FUSES

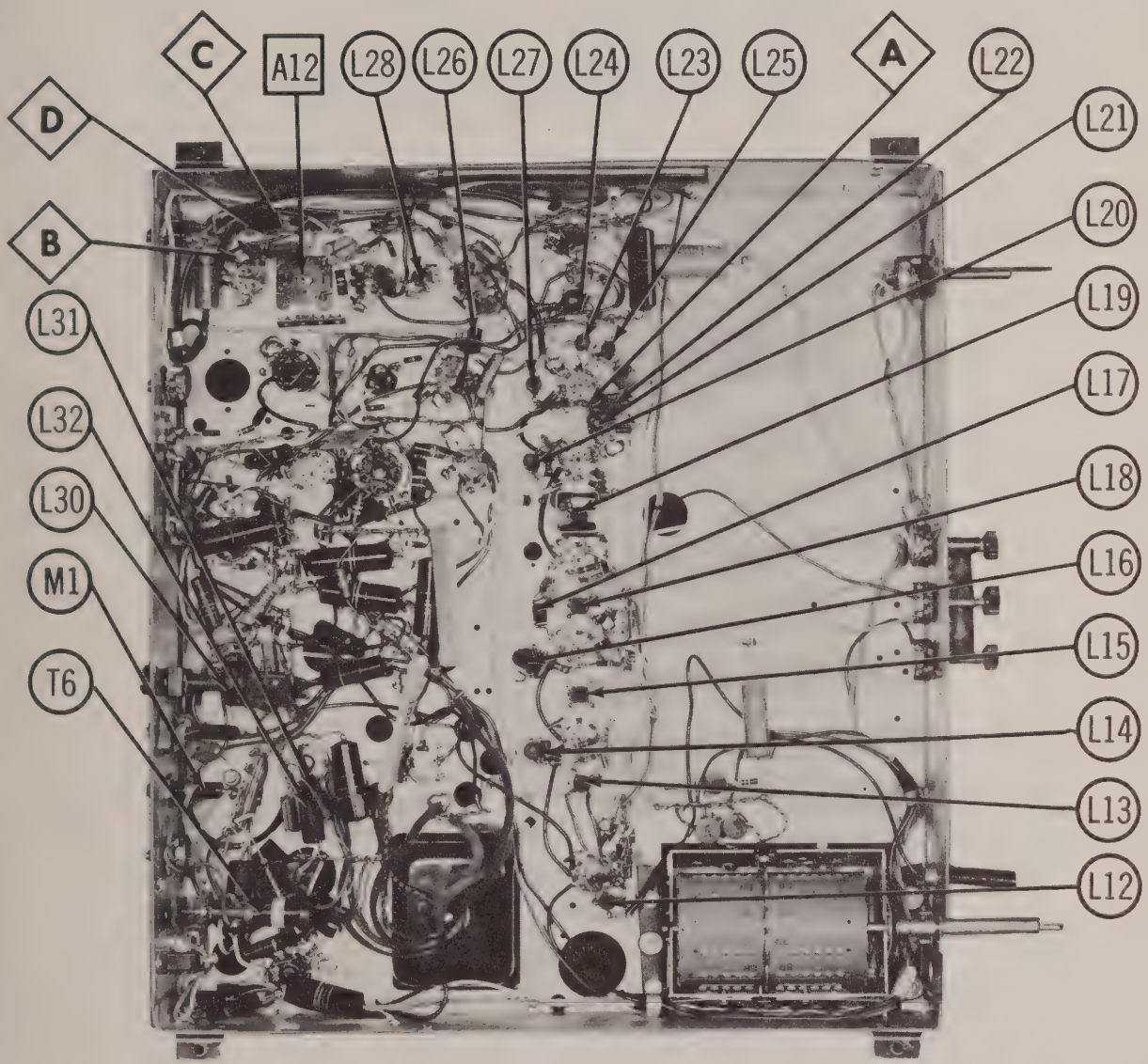
Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

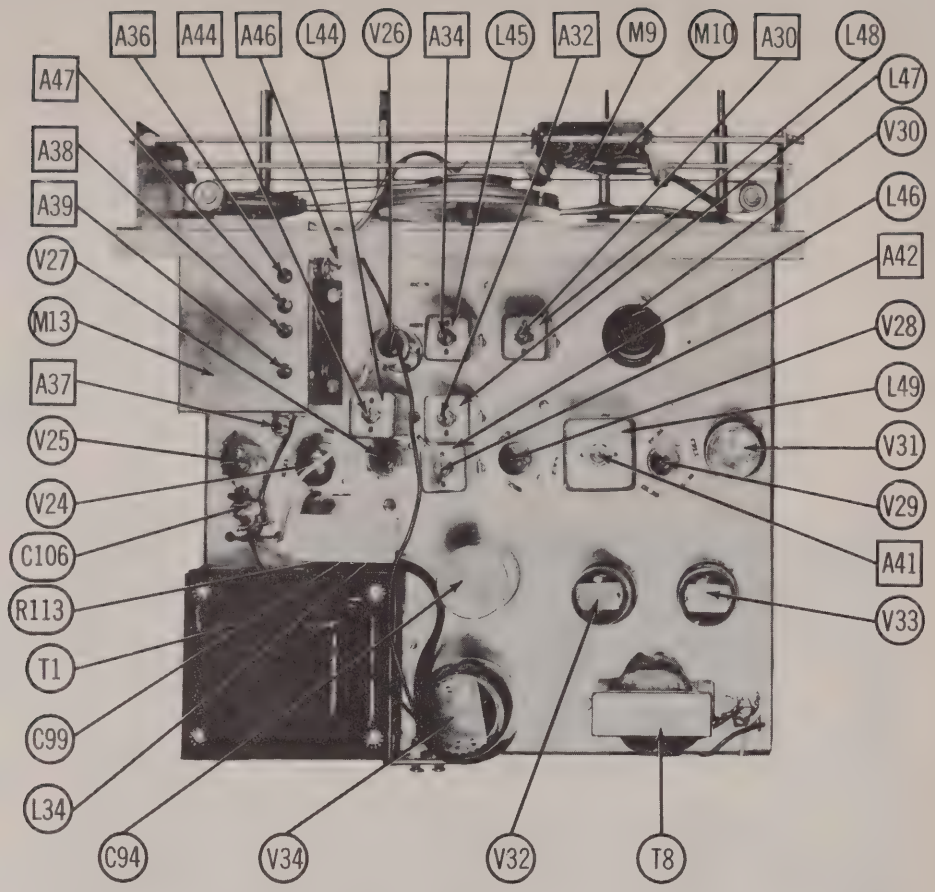
DISASSEMBLY INSTRUCTIONS

TV	RADIO
Remove 4 push on type control knobs from front panel.	Remove 5 push on type control knobs from front panel.
Remove 7 wood screws. Remove rear cover.	Disconnect 2 speakers, 2 leads from speaker crossover network.
Disconnect built-in antenna, AC radio plug from TV chassis,	Remove jewel and phono compartment lights.
TV jack and plug from radio chassis, and FM antenna leads	Disconnect phono audio lead and phono AC plug and AM antenna
from radio chassis.	leads.
Remove 4 chassis bolts. Remove TV chassis.	Remove 4 chassis bolts. Remove radio chassis.
	Remove 8 speaker wood screws. Remove 2 speakers (4 screws each.)

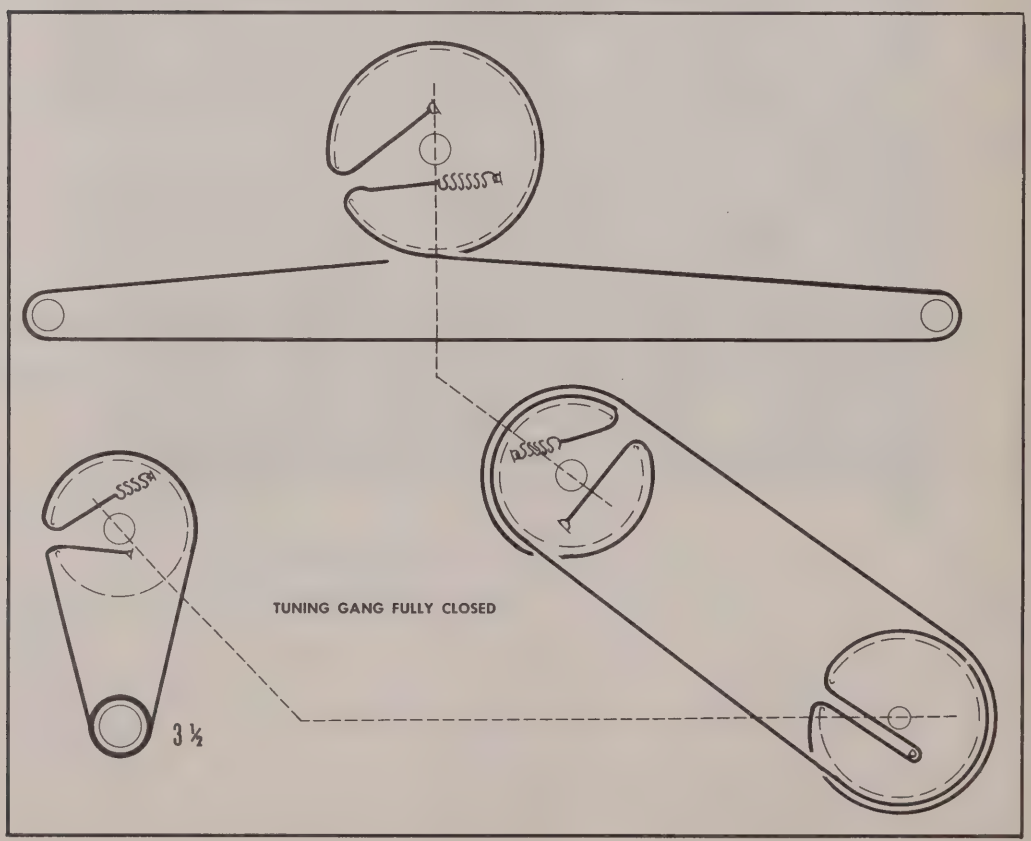


TV CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SET 221 FOLDER 6



RADIO CHASSIS TOP VIEW



DIAL CORD STRINGING

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-Horiz. AFC	6AL5	6AL5	6BT	
V8	Video Output	6AH6	6AH6	7BK	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AGC Clamper	6SQ7	6SQ7	8Q	
V14	Sync Separator	6AU6	6AU6	7BK	
V15	Sync Phase Inv.-Horiz. AFC	6SN7GT	6SN7GT	8BD	
V16	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6S4	6S4	9AC	
V18	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V19	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V23A	21FP4A	21FP4A 21FP4 ①	21FP4A	12C	① Circuit changes necessary
B	21MP4			12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	475	4232	E4C335		CO35		FP262	TVL-3 843	
B	▲30	475						TC84		
C	■30	475								
C2A	■60	350	4247	AFH3-29		CO23		FP391.1	TVL-3640	
B	▲40	350		PRS500/16		BR2050A		TC78	TVA-1804	
C	10	350								
D	▲20	475								
C3A	▲50	50	4230	AFH1-18		A020		FP115	TVL-1415	
B	■20	475								Note 1
C	20	25								Note 1
C4	5	50	4209	PRS150/4		BR550		TC30	TVA-1303	
C5	3-8				829-10					
C6	3-8				829-10					
C7	1000			EF-001	MFT-1000				503C-D1	
C8	3			SI3NP0			NP0K-030			
C9	.5-3				829-3			CT565A		
C10	120			BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C11	1000			EF-001	MFT-1000				503C-D1	
C12	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C13	1000			EF-001	MFT-1000				503C-D1	
C14	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C15	.5-3				829-3			CT565A		
C16	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C17	5			SI5N750	TCN-5		N750K-050		5TCUB-V5	
C18	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C20	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C21	1000			BPD-001	DD-102	TM5D1	80 1-001	DC-521	5HK-D1	
C22	1000			EF-001	MFT-1000				503C-D1	
C23	1000			EF-001	MFT-1000				503C-D1	
C24	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D1	
C25	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D1	
C26	.22	200	4131	P488-22		PTE4P22		PT4025	2TM-P22	
C27	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C28A	1500		14029	BPD-2X0015	DD2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C29	470		14027	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C30	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C31	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C32	470		14027	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C33	470		14027	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C34	1.0	100	14200	484-1.0		PJ2W1		PT41	2TM-M1	
C35A	1500		14029	BPD-2X0015	DD2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C36	5		4081	SI5NP0	TCZ-5		NP0K-050	ZT-555	5TCCB-V47	
C37	100	500								
C38	470		14027	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C39	470		14027	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C40	1500		14030	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C41	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C42	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C43	1500		14029	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C44	5		4081	SI5NP0	TCZ-5		NP0K-050	ZT-555	5TCCB-V47	
C45	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C46	47			SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C47	.22	200	4131	P488-22		PTE4P22		PT4025	2TM-P22	
C48	47	1500	4067	HV15-000047	D16-470			MCL477	20GA-Q47	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C49	5000		4039	BPD-005	MD-502	TMSD5	811-005	DC-525	5HK-D5	
C50	5		4061	SHNP0	TCZ-5		NPO1K-050	ZT-555	5TCCB-V47	
C51	5000		4039	BPD-005	MD-502	TMSD5	811-005	DC-525	5HK-D5	
C53	.001	400	4174	P688-001	D6-102	PTK6D1	GP2L-102	PT621	5TM-D1	
C53	5000		4039	BPD-005	MD-502	TMSD5	811-005	DC-525	5HK-D5	
C54	47			S147NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C55	47		14005	S147	D6-470		GP1K-470	UC-5447	5GA-Q47	
C56	5000		4039	BPD-005	MD-502	TMSD5	811-005	DC-525	5HK-D5	
C57A	4000	}	4038	BPD-32004	D6-402 }	TMSD04		DCD-534	5HK-ZD4	
B	4000	}			D6-402 }					
C58	5000		4039	BPD-005	MD-502	TMSD5	811-005	DC-525	5HK-D5	
C59	5000		4039	BPD-005	MD-502	TMSD5	811-005	DC-525	5HK-D5	
C60	390	500	14010	1469-0004		5R5T4		MCB243	MB-34	
C61	.0047	400	4127	P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	5TM-D47	
C62	.0047	400	4127	P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	5TM-D47	
C63	.0022	400	4136	P688-0022	D5-222	PTK6D22	GP2-333-222	PT6222	5TM-D22	
C64	250		4026	SH230	D6-251		GP2K-221	UC-5252	5GA-T22	
C65	.0047	600	4127	P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	5TM-D47	
C66A	.002					PTK6D3 }		PT622		
C B	.005	}	#9695	#PA-110	#PC-100	PTK6D5 }	#1405-01	PT625	#101C1	
C	.005	}				PTK6D5 }		PT625		
C67	.0039	600	14113	1464-004		DDR5D4		MCB463	MB-24	
C68	.047	300	4158	P488-047		PTK4S47		PT4147	3TM-S47	
C69	.1	600	14123	P688-1		PTK6P1	DP-104	PT601	5TM-P1	
C70	.1	600	4144	P688-1		DF-104	PTK6P1	PT601	5TM-P1	
C71	.047	600	4133	P688-047		DF-503	PTK6S47	PT6147	5TM-S47	
C72	.033	600	4134	P688-033		DF-303	PTK6S33	PT6123	5TM-S22	
C73	.001	400	4175	P688-001		D6-102	PTK6D1	GP2L-102	PT621	5TM-D1
C74	.001	400	3175	P688-001		D6-102	PTK6D1	GP1L-102	PT621	5TM-D1
C75	.01		14029	BPD-0015		DD-153	TMSD15	811-0015	DC-5215	5HK-D15
C76	.0047	400	4127	P688-0047		D6-472	PTK6D47	GP2-333-472	PT6247	5TM-D47
C77	.047	300	4147	P488-047		DF-503	PTK4S47		PT4147	3TM-S47
C78	3900	500	4085	1464-004			1DR5D4		MCB463	MB-24
C79	470	500	14009	1469-0005			5R5T5		MCB245	MB-35
C80	.001	600	14104	P688-001		D6-102	PTK6D1	GP2L-102	PT621	5TM-D1
C81	390	500	14010	1469-0004			5R5T4		MCB243	MB-34
C82	.0047	600	4128	P688-0047		D6-472	PTK6D47	GP2-333-472	PT6347	5TM-D47
C83	.1	600	4144	P688-1		DF-104	PTK6P1		PT601	5TM-P1
C84	.47	200	4173	P288-47			PJ2P5		PT405	2TM-P47
C85	.039	600	14125							
C86	.22	400	14103	P488-22			PTK4P22		PT4025	4TM-P22
C87	.033	600	14127	P688-033					PT6133	
C88	500	20000	4056	HV20C		TV3-502	MM-C20T5	413-501	HV20035A	30DK-T5
C89	.1	600	14133	P688-1		DF-104	PTK6P1		PT601	5TM-P1
C90	.1	600	4144	P688-1		DF-104	PTK6P1		PT601	5TM-P1
C91	.01	600	4105	8892X-01			PJ6S1		PT611	5TM-S1
C92	.01	600	4105	8892X-01			PJ6S1		PT611	5TM-S1
C93	47	1000	4067	HV315-0000-47		D15-470			MCL477	20GA-Q47

Note 1. Items C3B and C3C are not used.
Note 2. Items C66A, C66B, C66C, R79A, R79B, R79C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	HOFFMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	H-4686	Q17-109	AG-11-8		R1500L	Contrast
B	Shaft		Not Req.	Not Req.	FS-3		DS-38	Attach to R1A
C	Switch		Not Req.	T6-1	SWB		US-30	Attach to R1A
R2A	1Meg	½	H-4688	Q11-137	AG-61-8	AB-59	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSB-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ	½	H-4687	Q11-123	AG-44-8	AB-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	KSB-3	AK-4	Not Req.	Attach to R3A
R4A	25KΩ	½	H-4689	Q11-130	AG-46-8	AB-38	U-39	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSB-3	AK-4	Not Req.	Attach to R4A
R5A	50KΩ	½	H-4853	Q11-123	AG-44-8	AB-31	SU-35	Max. performance selector
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5000Ω	½	H-4685	Q11-124	AG-10-8	AB-10	SU-16	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2Meg	½	H-4884	Q11-139	AG-63-8	AB-75	SU-56	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	25KΩ	½	H-4859	Q11-130	AG-46-8	AB-36	SU-39	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A
R9A	1Meg	½	H-4884	Q11-138	AG-83-8	AB-75	SU-56	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R9A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	HOFFMAN PART No.	IRC PART No.	NOTES
R10	15KΩ	½			
R11	47KΩ	½			
R12	100KΩ	½			
R13	330KΩ	½			
R14	470Ω	½		BTS-470	
R15	180KΩ	½			
R16	15KΩ	½		BTS-15K	
R17	220KΩ	½			
R18	15KΩ	½		BTS-15K	
R19	10KΩ	½			
R20	4700Ω	½		BTS-4700	
R21	330KΩ 5%	½	4677	BTS-330K 5%	
R22	1.8Meg 5%	½	34612	BTS-180K 5%	
R23	330KΩ	½	34532	BTS-330K	
R24	15KΩ	½	4531	BTS-15K	
R25	470Ω	½	4664	BTS-470	
R26	47KΩ 5%	½	4537	BTS-47K 5%	
R27	47Ω	½	4639	BTS-47	
R28	120Ω	½	4546	BTS-120	
R29	470Ω	½	4664	BTS-470	
R30	47KΩ 5%	½	4537	BTS-47K 5%	
R31	120Ω	½	4546	BTS-120	
R32	470Ω	½	4664	BTS-470	
R33	470Ω	½	4664	BTS-470	
R34	3900Ω 5%	½	4654	BTS-3900 5%	
R35	47Ω	½	4639	BTS-47	
R36	120Ω	½	4546	BTS-120	
R37	470Ω	½	4664	BTS-470	
R38	3900Ω 5%	½	4541	BTS-3900 5%	
R39	120Ω	½	4546	BTS-120	
R40	470Ω	½	4664	BTS-470	
R41	12KΩ 5%	½	4656	BTS-12K 5%	
R42	22KΩ	½	4501	BTS-22K	
R43	4700Ω 5%	½	4649	BTS-4700 5%	
R44	680Ω	½	4514	BTS-680	
R45	1500Ω 5%	½	4610	BTS-1500 5%	
R46	3300Ω 5%	½	4648	BTA-3300 5%	
R47	470Ω	½	4664	BTS-470	
R48	120KΩ	½	4548	BTS-120K	
R49	22KΩ	½	4501	BTS-22K	
R50	47KΩ	½	4559	BTS-47K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	HOFFMAN PART No.	IRC PART No.	NOTES
R51	1500Ω	1	4581	BTA-1500	
R52	100KΩ	½	4511		
R53	1800Ω	½	4640	BTS-1800	
R54	1000Ω	½	4542	BTS-1000	
R55	47KΩ	½	4504		
R56	82Ω	½	4596	BTS-82	
R57	1000Ω	½	4542	BTS-1000	
R58	6800Ω	1	4608	BTA-6800	
R59	10MΩ	1	4644	BTA-10M	
R60	470Ω	½	4638	BTS-470	
R61	15KΩ	½	4521	BTS-15K	
R62	10KΩ	½	4597	BTS-10K	
R63	10KΩ	½	4597	BTS-10K	
R64	47KΩ	½	4504	BTS-47K	
R65	470KΩ 5%	½	34550	BTS-470K 5%	
R66	3300Ω	½	4607	BTS-3300	
R67	22KΩ	½	4628	BTS-22K	
R68	15KΩ	½	4619	BTS-15K	
R69	470KΩ	½	4632	BTS-470K	
R70	4.7Meg	½	4544	BTS-4.7Meg	
R71	330KΩ	½	34531	BTS-330K	
R72	82KΩ	½	24670	BTS-82K	
R73	18KΩ	½	4663	BTS-18K	
R74	1800Ω 5%	½	24517	BTS-1800 5%	
R75	1800Ω 5%	½	24517	BTS-1800 5%	
R76	390Ω	½	4549	BTS-390	
R77	22000Ω 5%	½	24525	BTS-22000 5%	
R78	22000Ω 5%	½	24525	BTS-22000 5%	
R79A	22KΩ	}	#9695	BTS-22K	
B	82000Ω	}		BTS-82000	
C	82000Ω	}		BTS-82000	
R80	4.7Meg	½	4544	BTS-4.7Meg	
R81	1000Ω	½	4659	BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	HOFFMAN PART No.	IRC PART No.	NOTES
R82	180KΩ	½	34507	BTA-180K	
R83	1.2Meg	½	34593	BTS-1.2Meg	
R84	680KΩ	1	34521	BTA-680K	
R85	5600Ω	½	4629	BTS-5600	
R86	470Ω	½	4664	BTS-470	
R87	150KΩ	1		BTA-150K	
R88	560Ω	½		BTS-560	
R89	560Ω	½		BTS-560	
R90	1000Ω	½		BTS-1000	
R91	22Ω	2	14529		
R92	100KΩ	½	4571	BTS-100K	
R93	100KΩ	½	4571	BTS-100K	
R94	470KΩ	½	4506	BTS-470K	
R95	4.7Meg	½	4544	BTS-4.7Meg	
R96	1500Ω 5%	½	4610	BTS-1500 5%	
R97	8200Ω	½	4651	BTS-8200	
R98	82KΩ	½	24670	BTS-82K	
R99	180KΩ	½	4634	BTS-180K	
R100	1000Ω	½	4659	BTS-1000	
R101	8200Ω	½	4651	BTS-8200	
R102	100Ω	½	4566		
R103	4.7Meg	½	34659	BTS-4.7Meg	
R104	560KΩ	½	4590	BTS-560K	
R105	120Ω	2	4657	BTW-2-120	
R106	6800Ω	2	24674	BTS-6800	
R107	3.3Ω	½	4751		
R108	150Ω	10	4730	1 3/4A-150	
R109	150Ω	10	4730	1 3/4A-150	
R110A	1100Ω	10	4731		
B	8800Ω	}			
R111	1000Ω	½	4542	BTS-1000	
R112	2200Ω	½		BTS-2200	

◆ Items R79A, R79B, R79C, C66A, C66B, C66C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ⑥ 1.8A	650VCT .350ADC	5VAC ⑨ 3A	6.3VAC ⑨ 4.5A	5030				R-42BS	
			SEC. 4.	SEC. 5.						
			5.3VAC ⑨ 1.2A	6.3VAC ⑨ 7.9A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE pri.	DC RESISTANCE SEC.	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	542Ω tap ⑨ 22Ω	28.15Ω tap ④ 3.1Ω, 5.4Ω, 23.4Ω 28.4Ω	5160		HVO-9 ①	TFB-18②	D-19 ②		Horiz. Output Trans.
		SEC. 2. 0Ω							
T3	1600Ω tap ⑨ 5Ω		5157	A-8141	A-3039	TSO-12	A-104X		Vert. Output Trans.
T4A	35Ω		9729		DY-11A ③	TY-7 ④	Y-22 ④		Horiz. Deflection Coils
B	45Ω					TL-3	WC-12		Vert. Deflection Coils
T5	6.5Ω tap ⑨2.5Ω		5422						Horiz. Linearity Coil
T6	2.5Ω		5457		MWC-6	TW-7	WC-12⑤		Width Coil

① Connect linearity coil in plate circuit of damper tube.
② Wire as in original circuit except, connect original terminal #4 to new #5, original terminal "" to new #4.
③ Use original horizontal deflection coil network.
④ Use original deflection coil network.
⑤ Connect to coded blue and green terminals.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω						Wound on 68MMF Cap.
L2	IF Trap	0Ω						Wound on 68MMF Cap.
L3A	Ant. Coil	0Ω CT	0Ω	5360R				Channel 2
B	Ant. Coil	0Ω CT	0Ω	5361R				Channel 3
C	Ant. Coil	0Ω CT	0Ω	5362R				Channel 4
D	Ant. Coil	0Ω CT	0Ω	5363R				Channel 5
E	Ant. Coil	0Ω CT	0Ω	5364R				Channel 6
F	Ant. Coil	0Ω CT	0Ω	5365R				Channel 7
G	Ant. Coil	0Ω CT	0Ω	5366R				Channel 8
H	Ant. Coil	0Ω CT	0Ω	5367R				Channel 9
I	Ant. Coil	0Ω CT	0Ω	5368R				Channel 10
J	Ant. Coil	0Ω CT	0Ω	5369R				Channel 11
K	Ant. Coil	0Ω CT	0Ω	5370R				Channel 12
L	Ant. Coil	0Ω CT	0Ω	5371R				Channel 13
L4	IF Trap	.9Ω						
L5	Fil. Choke	0Ω						
L6	Neutr. Coil	0Ω						
L7A	RF, Mixer Grid & Osc. Coil	0Ω		5346R				Channel 1
B	RF, Mixer Grid & Osc. Coil	0Ω		5349R				Channel 3

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
C	RF, Mixer Grid & Osc. Coil	0Ω		5350R				Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		5351R				Channel 5
E	RF, Mixer Grid & Osc. Coil	0Ω		5352R				Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		5353R				Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		5354R				Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		5355R				Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		5356R				Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		5357R				Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		5358R				Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		5359R				Channel 13
L8	Fil. Choke	0Ω						
L9	Feedback Coil	1.4Ω						
L10	RF Choke	0Ω						
L11	Conv. Plate	0Ω	0Ω					
L12	1st. Video IF	0Ω	.1Ω	5441		17-4523	6219	
L13	2nd. Video IF	.1Ω	.3Ω	5443		17-4523	6219	
L14	47.25MC Trap	.1Ω		5440				
L15	3rd. Video IF	.1Ω	.1Ω	5439		17-4523	6219	
L16	41.25MC Trap	0Ω		5434				
L17	Fil. Choke	0Ω		5133		19-3001 TV-189	6175	.4 Microhenry
L18	4th. Video IF	.1Ω	.1Ω	5439		17-4523	6219	
L19	5th. Video IF	.1Ω	.1Ω	5439		17-4523	6219	
L20	Cathode Trap	.1Ω						
L21	Series Peaking Coil	14Ω						560 Microhenries
L22	Shunt Peaking Coil	30Ω		5434				970 Microhenries
L23	Series Peaking Coil	9.5Ω		5433		19-3160 ▲ TV-184 ▲	6644 ▲	150 Microhenries, wound on 39KΩ resistor
L24	Shunt Peaking Coil	17Ω		5340		19-3300 †	6645 †	350 Microhenries, wound on 10Meg resistor
L25	4.5MC Trap	2.5Ω		5402				
L26	Fil. Choke	0Ω		5133		19-3001 TV-189	6175	.4 Microhenry
L27	1st. Sound IF	8Ω		5430		17-3400 TV-151	1470	
L28	2nd. Sound IF	2.6Ω		5431		17-3400 TV-151	1469	
L29	Ratio Det.	4.6Ω	.3Ω CT	5429		17-3498 TV-115 *	6305 *	Tertiary Winding -1Ω
L30	Horiz. Osc.	90Ω		5300		19-1578 TV-183	6210	
L31	RF Choke	.1Ω		5266			4608	4 Microhenries
L32	RF Choke	.1Ω		5266			4608	4 Microhenries

* Use Adaptor Plate
† Parallel with 10Meg resistor
▲ Parallel with 39KΩ resistor

FUSES

ITEM No.	TYPE	RATING	HOFFMAN PART No. FUSE	HOFFMAN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	3 Amp. 125 V.	9648		313003 (3A-3AG-SB)	342001	MDL-3	HKP
M2	3AG	1/4A. 250 V.	9615		312.250 (1/4-3AG-PT)	357001	AGC-1/4	4405

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M3	Dial Light		Type #44 (Channel Selector)
M4	RF Tuner	9758	
M5	Centering Magnet	9732	
M6	Ion Trap	9713	
	Cabinet	7653	Model 21M906 (Mah.)
	Cabinet	7654	Model 21P907 (Oak)
	Cabinet	7655	Model 21P908 (Cherry)
	Safety Glass	773	
	Mask	3804	
	Back Cover	33594	Includes line cord
	Bottom Cover	3807	
	Control Cover	33582	
	Knob	33560C	Channel Selector (Complete Assy)
	Knob	33556C	Off/On Volume (Outer)
	Knob	33557	Off/On Volume (Skirt)
	Knob	3813	Brightness
	Knob	3814	Vert. Hold
	Knob	3815	Horiz. Hold

DENVER COLORADO

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		HOFFMAN PART No.	STANDARD REPLACEMENT		
V24	FM RF Amplifier-FM Mixer	12AT7	12AT7	9A	
V25	AM RF Amplifier	6BA6	6BA6	7BK	
V26	AM Converter-FM Oscillator	6BE6	6BE6	7CH	
V27	1st. FM AM IF Amp.	6BA6	6BA6	7BK	
V28	2nd. FM AM IF Amp	6BA6	6BA6	7BK	
V29	Ratio Detector	6AL5	6AL5	6BT	
V30	AM Detector-AGC-1st. AF Amp.	6SQ7	6SQ7	8Q	
V31	2nd. AF Amplifier-Phase Inverter	6SN7GT	6SN7GT	8BD	
V32	Audio Output	6V6GT	6V6GT	7S	
V33	Audio Output	6V6GT	6V6GT	7S	
V34	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C94A	▲20	450	4237	AFH4-14		DO13		FP444	TVL-4763	
B	■20	450								
C	20	450								
D	▲20	450								
C95	25	25	4239	PRS25/25		BR252A		TC26	TVA-1205	
C96	4	450	4236	PRS450/4		BR445		TC70	TVA-1702	
C97	2	50	4238	PRS150/4		BBR2-50T		TC302	TVA-1301	
C98	50	50	4250	PRS50/50		BR505		TC39	TVA-1308	Note 2
C99	470		4049	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C100	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C101	33		14020	SI33	D6-330		GP1K-330	UC-5433	5GA-Q33	
C102	100		4079	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C103	2.2		14019	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C104	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C105	130		14003							
C106	100		4079	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C107	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C108	1500		4096	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C109	1500		4096	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C110	100		14021	SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C111	47		14005	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C112	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C113	2		4099							
C114	2		4099							
C115	10		14004	SI10	D6-100		GP1K-100	UC-541	5GA-Q1	
C116	30		14026							
C117	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C118	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C119	220		4026	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C120	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C121	.047	200	4147	P488-047	DF-503	PTE4S47		PT4147	2TM-S47	
C122	2200		14023	SI2200	D6-222		GP2-333-222	UC-5222	5HK-D22	
C123	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C124	220		4026	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C125	220		4026	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C126	2200		14023	SI2200	D6-222		GP2-333-222	UC-5222	5HK-D22	
C127	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C128	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C129	100		4079	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C130	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C131	330		4065	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C132	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C133	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C134	.0022	400	4180	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C135A	50		†9706	†PA-99	†PC-52	TM5Q5	†1403-03	UC-545	†100C3	
B	50					TM5Q5		UC-545		
C136	220		4026	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C137	.01	400	4142	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C138	.01	400	4142	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C139	100		4079	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C140	.1	200	4143	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C141	.047	200	4147	P488-047	DF-503	PTE4S47		PT4147	2TM-S47	
C142	.1	600	4144	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C143	100		4079	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C144	.0033	600	14111	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D33	
C145	.1	600	4144	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C146	1000		14022	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C147	.01	400	4142	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C148	.022	600	4124	P688-022	DF-203	PTE6S22		PT6122	6TM-S22	
C149	.022	600	4124	P688-022	DF-203	PTE6S22		PT6122	6TM-S22	
C150	.001	600	4146	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C151	.001	600	4146	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C152	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C153	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C154	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C155	1.0	100		484-1.0		PJ2W1		PT41	2TM-M1	Note 2

Note 2. Not used in all Models.

† Items C135A, C135B, R136 are combined in one unit.

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HOFFMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R113A	1Meg	½	H4845	Q13-137X	AT-98	BT-73	UT-438	Volume-Tapped ⓐ 300KΩ
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R113A
R114A	500KΩ	½	H4870	QJ-459R *			UF55A	Bass-Panel
B	500KΩ	½					UR55A	Treble-Rear
C	Switch						US-26	Attach to R114B

* CONCENTRIKIT EQUIVALENT - KIT K-2 BASE ELEMENTS & SHAFTS B13-133 & P2-209 (Panel)
B13-133 & R1-226 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.	
R115	220Ω	½	4530	BTS-220	
R116	1000Ω	½	4542	BTS-1000	
R117	470KΩ	½	4506	BTS-470K	
R118	1Meg	½	4513	BTS-1Meg	
R119	68Ω	½	4524	BTS-68	
R120	56KΩ	½	24652	BTS-56K	
R121	1000Ω	½	4542	BTS-1000	
R122	3900Ω	½	4527	BTS-3900	
R123	27KΩ	½	24618	BTS-27K	
R124	1Meg	½	4513	BTS-1Meg	
R125	22KΩ	½	4501	BTS-22K	
R126	8200Ω	1	4658	BTA-8200	
R127	1Meg	½	4513	BTS-1Meg	
R128	470KΩ	½	4506	BTS-470K	
R129	1000Ω	½	4542	BTS-1000	
R130	1000Ω	½	4542	BTS-1000	
R131	100KΩ	½	4511	BTS-100K	
R132	68Ω	½	4524	BTS-68	
R133	4700Ω	2	4551	BTB-4700	
R134	68Ω	½	4524	BTS-68	
R135	4700Ω	2	4551	BTB-4700	
R136	47KΩ	½	†9706	BTS-47K	
R137	270Ω	½	4601	BTS-270	
R138	33KΩ	½	24627	BTS-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.	
R139	15KΩ	½	4521	BTS-15K	
R140	100KΩ	½	4511	BTS-100K	
R141	220KΩ	½	4500	BTS-220K	
R142	470KΩ	½	4506	BTS-470K	
R143	22KΩ	½	4501	BTS-22K	
R144	4700Ω	½	4543	BTS-4700	
R145	10KΩ	½	4515	BTS-10K	
R146	4.7Meg	½	4544	BTS-4.7Meg	
R147	220KΩ	½	4500	BTS-220K	
R148	220KΩ	½	4500	BTS-220K	
R149	100KΩ	½	4571	BTS-100K	
R150	22KΩ	½	4501	BTS-22K	
R151	2700Ω	½	4579	BTS-2700	
R152	220KΩ	½	4500	BTS-220K	
R153	220KΩ	½	4500	BTS-220K	Note
R154	47KΩ	½	4559	BTS-47K	
R155	47KΩ	½	4559	BTS-47K	
R156	10KΩ	½	4515	BTS-10K	
R157	470KΩ	½	4506	BTS-470K	
R158	270Ω	2	14639		
R159	470KΩ	½	4506	BTS-470K	
R160	500Ω	7.8	4747	1 3/4A-500	
R161	2600Ω	6.5	4745	1 3/4A-2500	

Note: Not used in all Models.
† Items R136, C135A, C135B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T7	117VAC ⓐ1.03A	695VCT .130ADC	5VAC ⓐ 3A	6.3VAC ⓐ3.7A	5026	PM-8411			R-20B	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T8	9.8KΩ CT	4.2Ω	380Ω CT	.48Ω	5152	A-3831 ①	A-2936 ①	RO-302 ①	S-15X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS'			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	HOFFMAN PART No.	VIKING PART No.	QUAM PART No.	
SP1	12"	PM	3.4Ω	9088 ①	12J11	12A6A	① Both speakers used in a cross-over network.
SP2	51/4"	PM	3Ω	①	525J4	52A1	

TONE CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L33		.2Ω						

Not used in all Models.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L34	FM Ant. Coil	0Ω		5398				Wound on 1.5KΩ resistor
L35	RF Choke	1.6Ω		5412			4612	10 Microhenries
L36	FM RF Coil	0Ω		5416				Tapped
L37	FM Osc. Coil	0Ω		5415				
L38	AM Loop Ant.	.1Ω	1.3Ω	5409				
L39	AM RF Coil	37Ω	4.6Ω	5399	14-1076	BC-382	72-RF	
L40A	Fil. Choke	.1Ω		5159			4610	6 Microhenries
B	Fil. Choke	.1Ω					4610	6 Microhenries
L41	RF Choke	.5Ω		5411	19-3001	TV-189	6175	.8 Microhenry
L42	AM Osc. Coil	7Ω		5407			71-Osc.†	
L43	Parasitic Suppressor	0Ω		5400				Wound on 22Ω resistor
L44	1st. FM IF	.5Ω	1.1Ω	5403	16-3471	FM-254 *	1463 *	
L45	1st. AM IF	13Ω	.9Ω	5405	16-6758 *	BC-352 *	12-C1 *	Sec. Tapped

HOFFMAN
MODELS 21B907, 21M906, 21P908

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L46	2nd. FM IF	3.3Ω	1.3Ω	5404	16-3472	FM-254 *	1463 *	
L47	2nd. AM IF	13Ω	.9Ω	5405	16-6758 *	BC-352 *	12-C1 *	Sec. Tapped
L48	3rd. AM IF	13Ω	13Ω	5406	16-6758 *	BC-353 *	12-C2 *	
L49	Ratio Det.	1.2Ω	.2Ω CT	5413	17-3487	FM-255 *	1465 *	Tertiary winding -.3Ω
L50	Line RF Filter Choke	0Ω			19-3001	TV-189	6175	.4 Microhenry
L51	Line RF Filter Choke	0Ω			19-3001	TV-189	6175	.4 Microhenry

† Drill mounting hole.
* Use adaptor plate

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	HOFFMAN PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M7		ACD-J	A-1 A-3	W22AB	A65MG A62A	96	0-1 or S-1 and 0-3 or S-3	

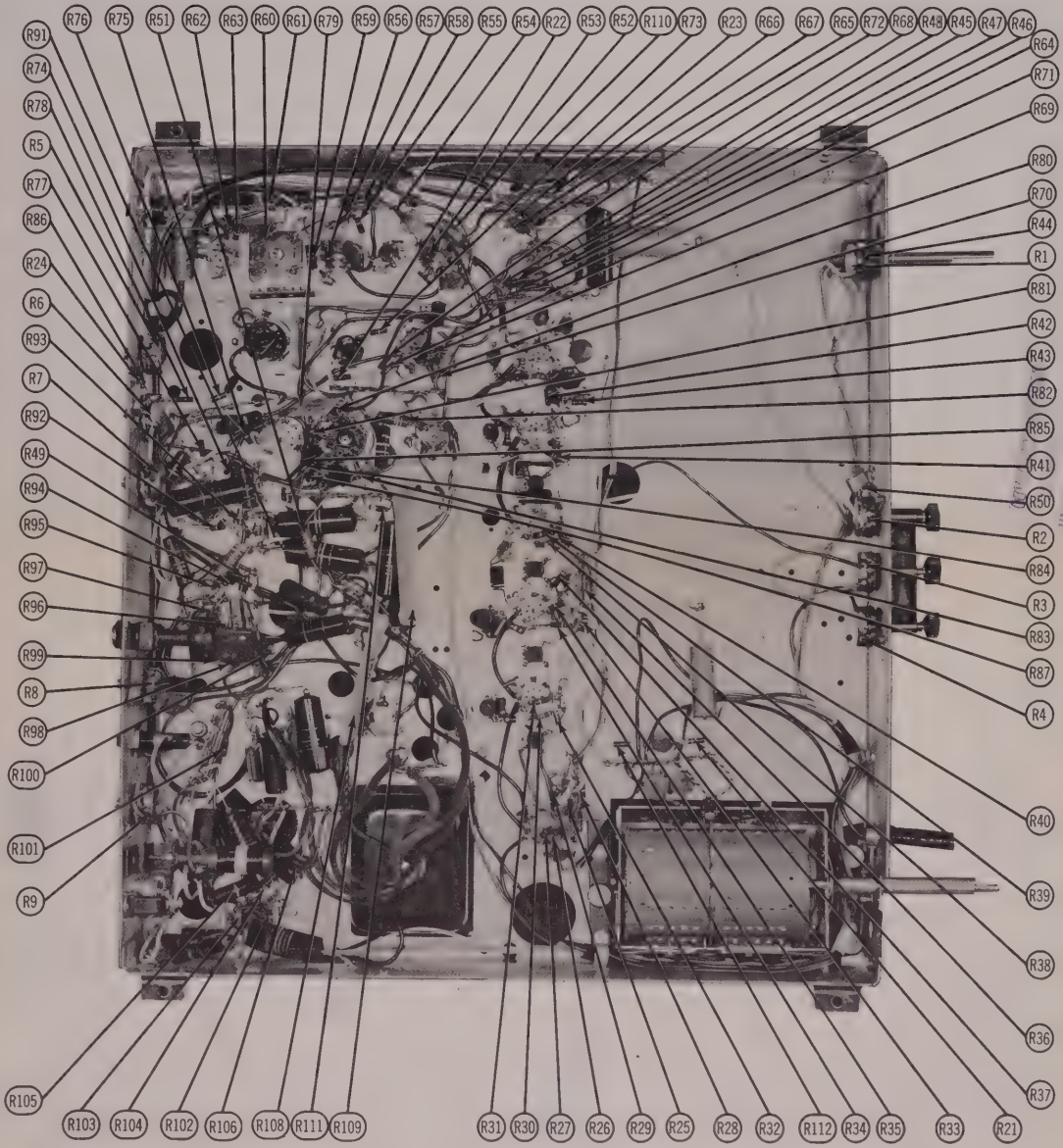
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	HOFFMAN PART No.	WALCO PART No.	JENSEN PART No.	
M8		W-30MGS or W-30MGA and W-30S or W-30A	JP-30LP or JPS-30LP and JP-30 or JPS-30	

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M9	Dial Light	9676	Type #51, AM Indicator
M10	Dial Light	9676	Type #51, FM Indicator
M11	Dial Light	9676	Type #51, Power Indicator
M12	Dial Light	9676	Type #51, Phono Indicator
M13	Tuning Cap.	4416	3 Gang (16-457MMF, 19-245MMF, 18-125MMF)
M14	Switch	6031	Function Selector 4 pole-4 position
	Knob	33565C	Radio Tuning
	Knob	33567C	Function Selector
	Knob	33568C	Volume
	Knob	33571	Bass
	Knob	33566C	Treble



TV CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MAJESTIC
MODELS 21P62, 21P63 (Series 110, 111)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PROPERTY OF
L. F. WHITSHIP
DENVER, COLORADO

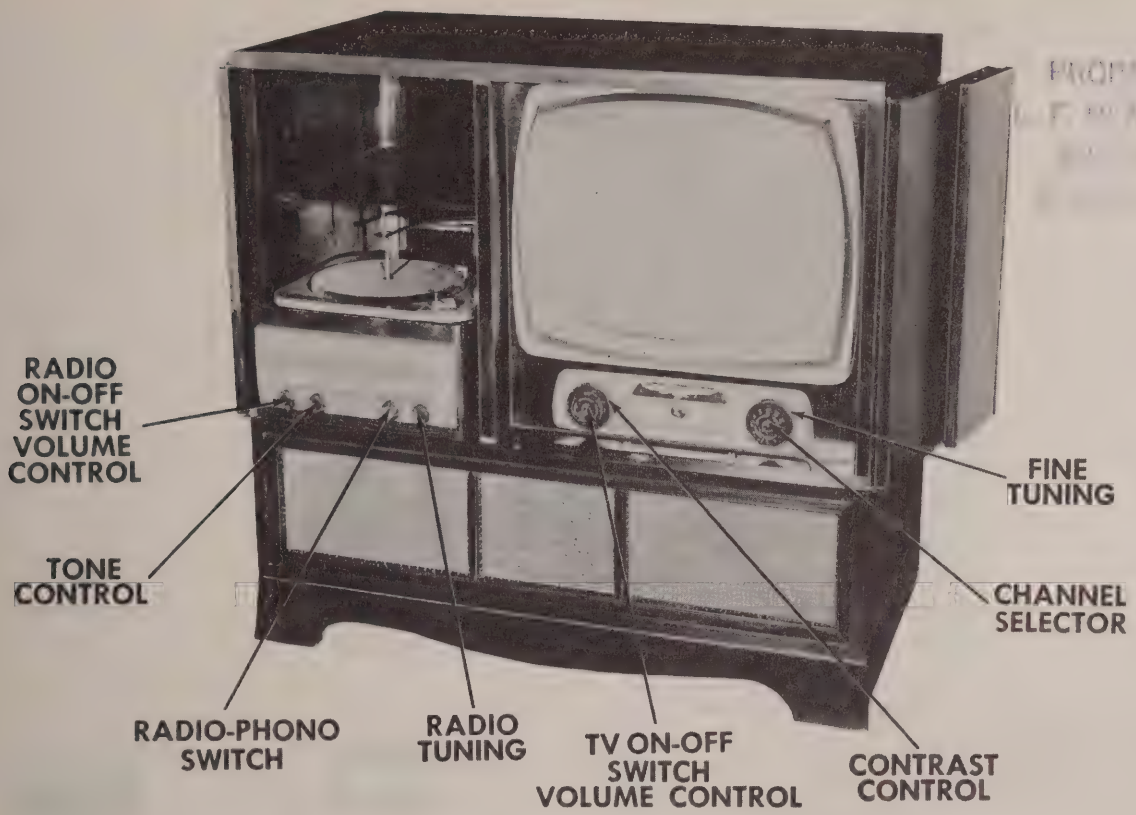
MAJESTIC
MODELS 21P62, 21P63 (Series 110, 111)

MODEL 21P62 SERIES 111

PROPERTY OF
L. F. WHITSHIP
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



MAJESTIC
MODELS 21P62, 21P63 (Series 110, 111)

MAJESTIC 21P62

TRADE NAME	Majestic Models 21P62, 21P63 (Series 110, 111)
MANUFACTURER	Majestic Radio & Television Div. of Wilcox-Gay Corp., 70 Washington St., Brooklyn, N.Y.
TYPE SET	TV-AM-Phono Combination Receiver
TUBES	Nineteen (TV) Five (Radio)
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.64 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 24.75MC, Sound IF 20.25MC (Intercarrier), Radio 530-1700KC, AM IF 455KC

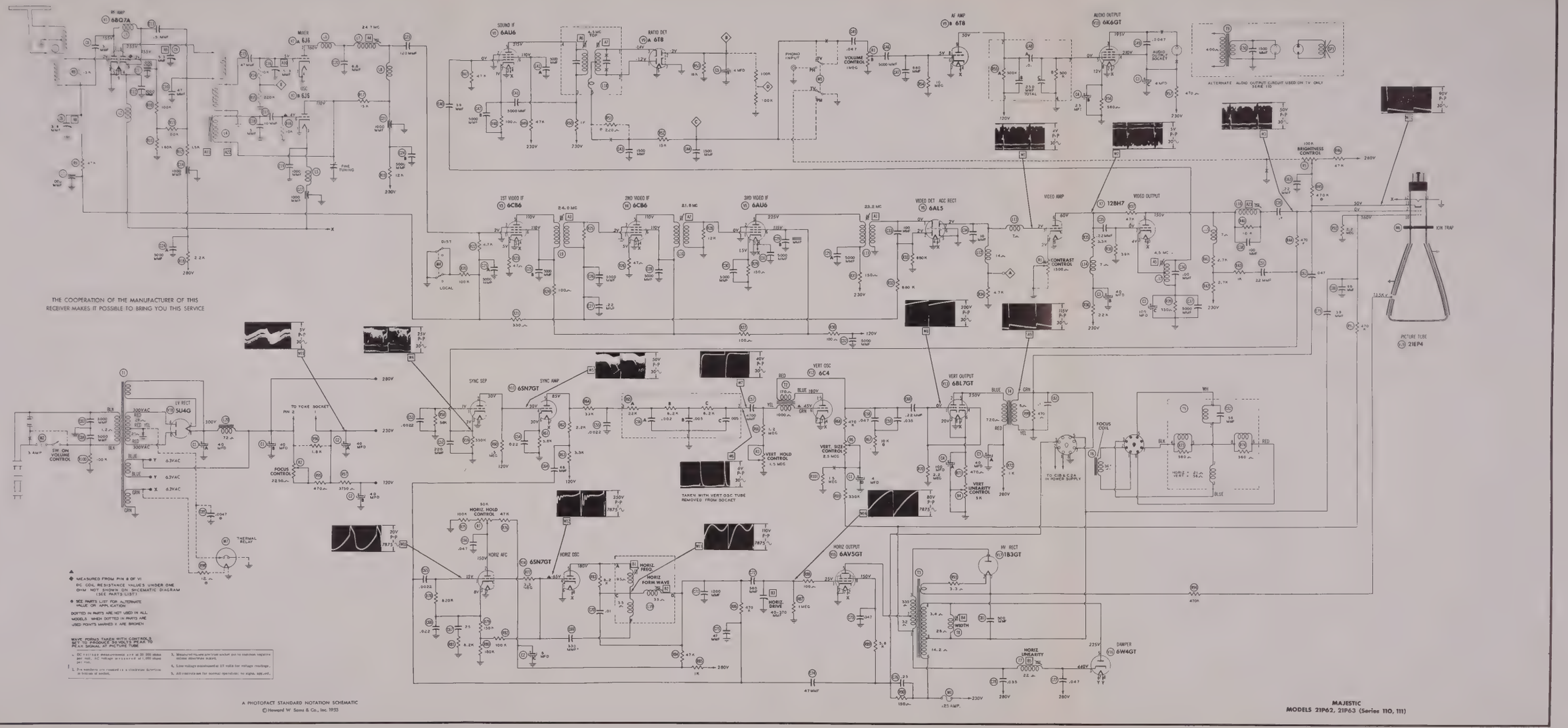
INDEX

Alignment Instructions 6, 7
Drive Cord Stringing (Radio) 19
Disassembly Instructions 22
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 15 thru 19
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View (TV) 3
Radio Chassis (Top & Bottom View) 14
RF Tuner 10
Photographs (Cont)
Resistor Identification 23, 24
Trans., Inductor and Alignment Identification 20
Resistance Measurements 8
Servicing in the Field 22
Schematic (Radio) 13
Schematic (TV) 2
Trouble Shooting Aids 12, 21
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

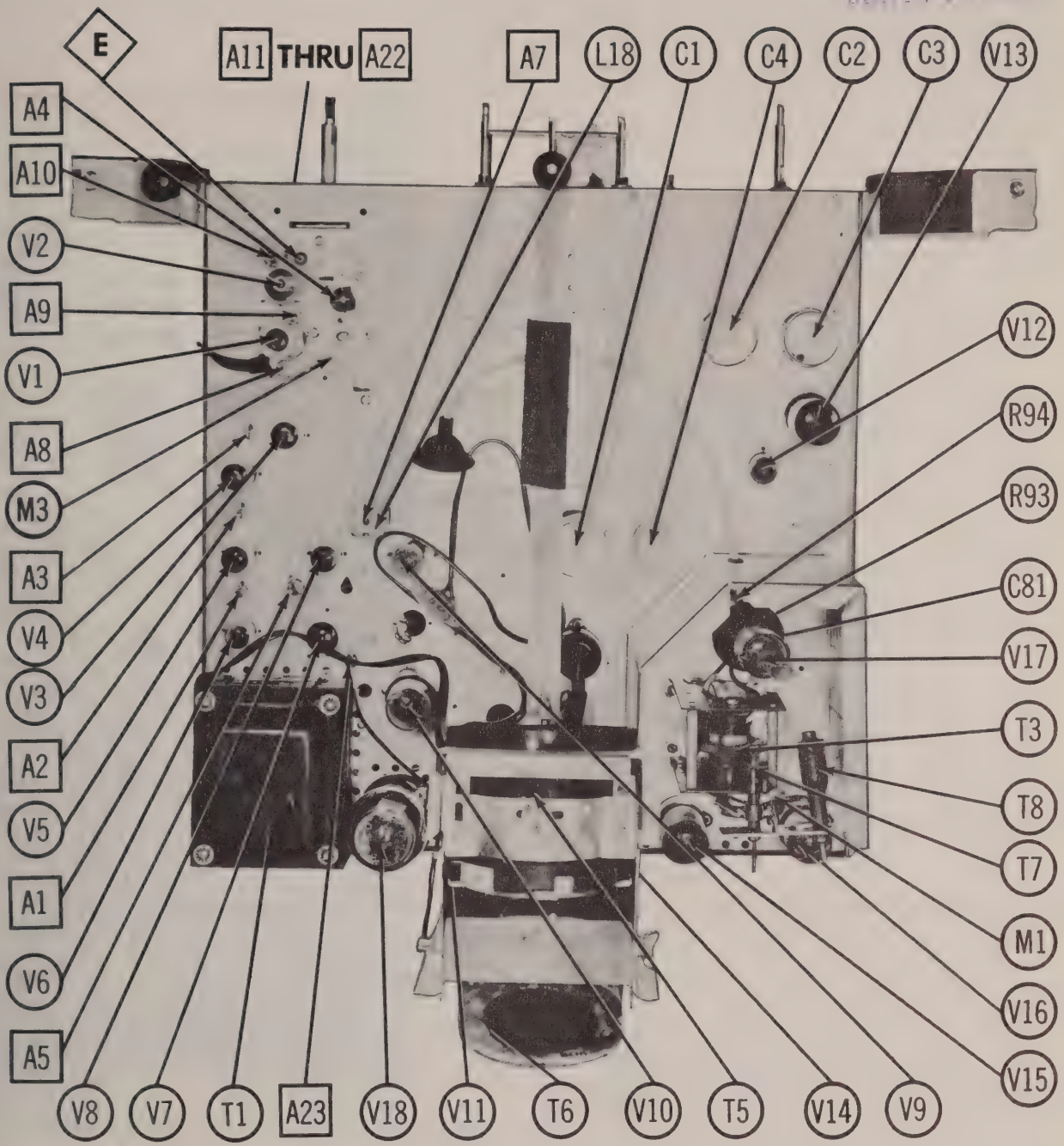
WEBSTER-CHICAGO RECORD CHANGER MODEL 114.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

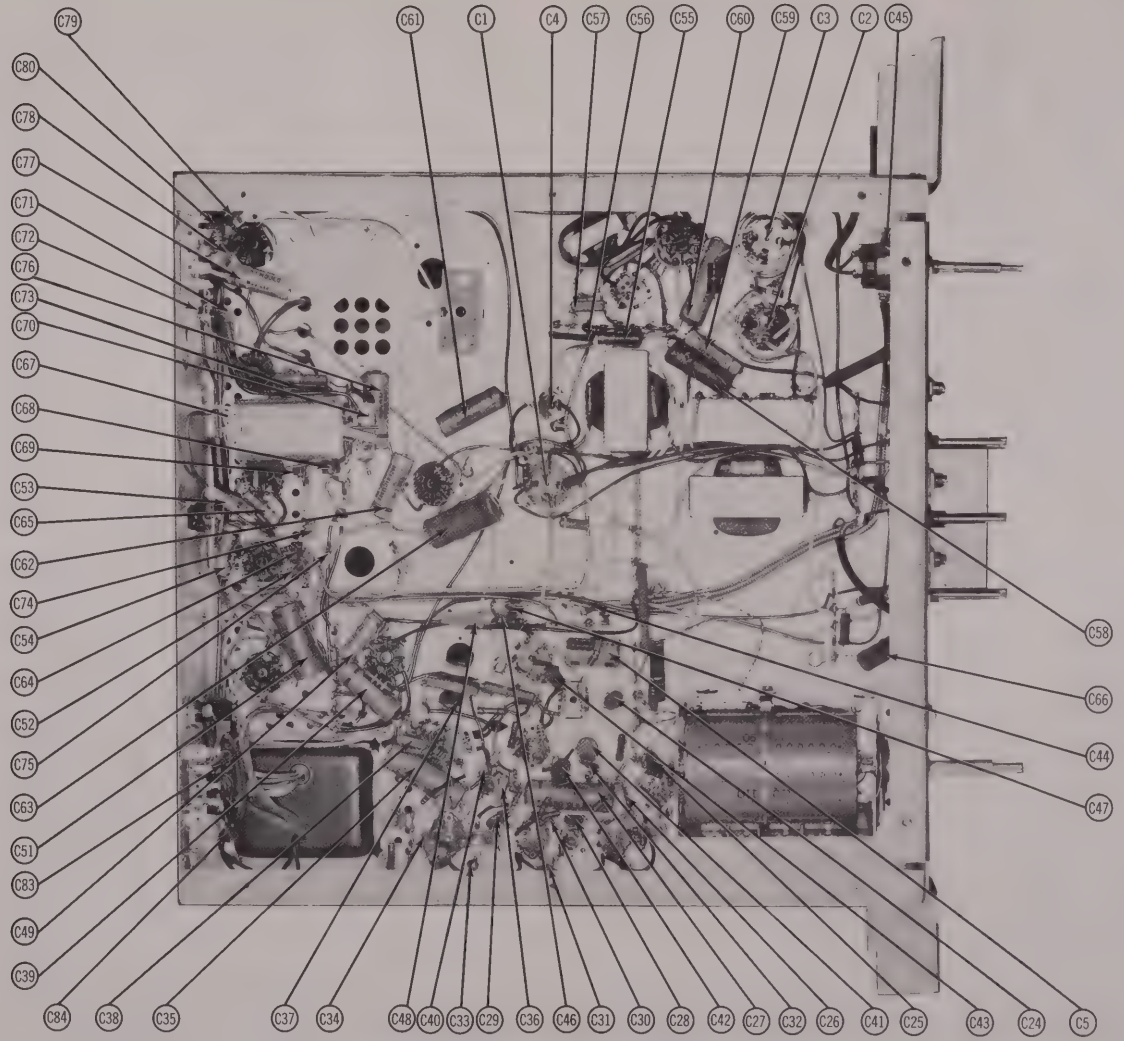
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
MAJESTIC
MODELS 21P62, 21P63 (Series 110, 111)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953

MAJESTIC
MODELS 21P62, 21P63 (Series 110, 111)



TV CHASSIS TOP VIEW

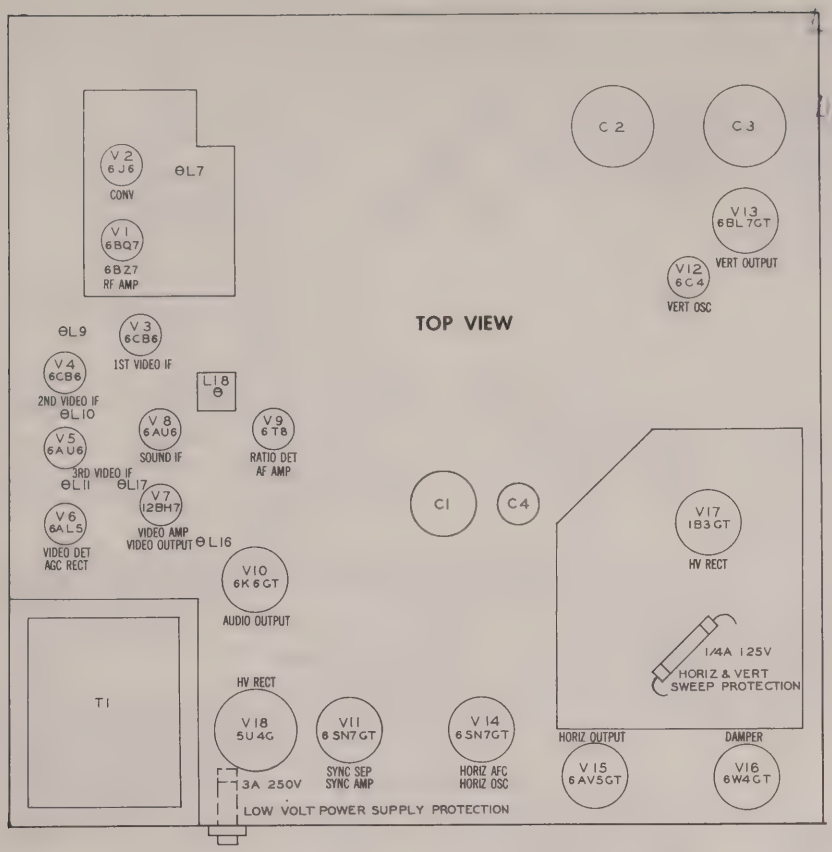


TV CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
L. [illegible] SHIP

TUBE PLACEMENT CHART

PROPERTY OF
F. FRANKENS



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V18 , Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V7**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V7, V19**
Has pic, no sound - **V8, V9, V10**

SYNC FAILURE
No vert. sync - **V11, V12, V13**
No horiz. sync - **V11, V14**
No vert. or horiz. sync - **V11**

SWEEP FAILURE
No raster, has sound - **V14, V15, V16, V19, Fuse (M2)**
No vertical deflection - **V12, V13**
Poor vert. linearity or foldover - **V12, V13**
Poor horiz. linearity or foldover - **V14, V15, V16**
Narrow picture - **V14, V15, V16, V17, V18**
Vert. off freq. - **V11, V12, V13**
Horiz. off freq. - **V11, V14**

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Set the contrast control fully counter clockwise. Connect the negative lead of a 3 volt battery to the ungrounded side of C25A. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.2MC (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator to maintain 1.5 volt reading.
2.	"	"	21.8MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	24.0MC	"	"	A3	"
4.	"	"	24.7MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	20.25MC 21.75MC 24.75MC	Any	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig.1. If necessary retouch A1 thru A4.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point B to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.
Set the TV-Phono switch to "TV" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.0015MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A5, A6	Adjust for maximum deflection. When adjusting A5 two peaks maybe found. Correct peak is obtained when screw is at most outward maximum reading position.
7.	"	"	"	"	DC probe to point (C). Common to point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizonal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.0015MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry similar to Fig.2.
7.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A7	Reconnect stabilizer capacitor C4. Adjust A7 so that 4.5MC occurs at the center of crossover lines as in Fig. 3. SLIGHTLY retouch A6 for maximum amplitude and symmetry of crossover lines.

RF AND MIXER ALIGNMENT

Remove bias battery used in video IF alignment and connect a short across C25A.
Remove dummy converter tube and replace original 6J6 in its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A8, A9, A10	Adjust for response curve similar to Fig.4. with markers at not less than 70%.
9.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	"	Check all channels for proper markers placement. If markers fall below 70% on any channel make slight compromise adjustment of A8, A9 and A10 with channel selector set for that channel. Recheck all channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

TV ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel selector switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A11	Adjust to place sound marker as shown in Fig. 5. The video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

PROPERTY OF
L. F. BLANKENSHIP

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.0015MFD	High side to point (A). Low side to chassis.	4.5MC (400~Mod.)	Any	DC probe thru detector (Fig. 6) to pin 2 (grid) of picture tube. Common to chassis.	A23	Remove V5 (6AU6) from socket. Short out sound take-off coil (L17). Adjust A23 for minimum deflection. Replace V5 and remove short across L17.

ALTERNATE 4.5MC TRAP ALIGNMENT

If an accurate 4.5MC is not available tune in the strongest TV station available.
Short out the sound take-off coil L17.
Examine the picture for evidence of 4.5MC beat in the picture.
Adjust A23 for minimum 4.5MC interference.

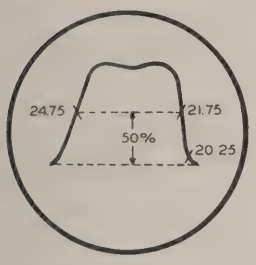


FIG. 1

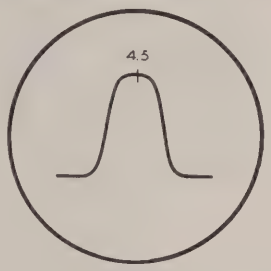


FIG. 2

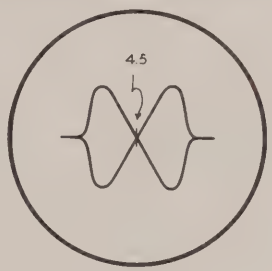


FIG. 3

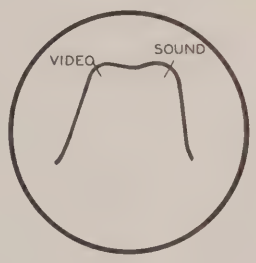


FIG. 4

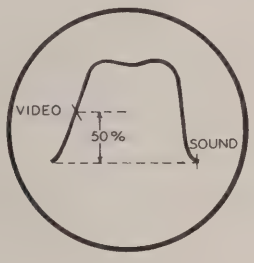


FIG. 5

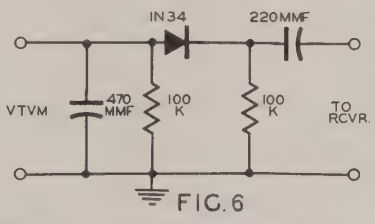


FIG. 6

RADIO ALIGNMENT INSTRUCTIONS

RADIO ALIGNMENT

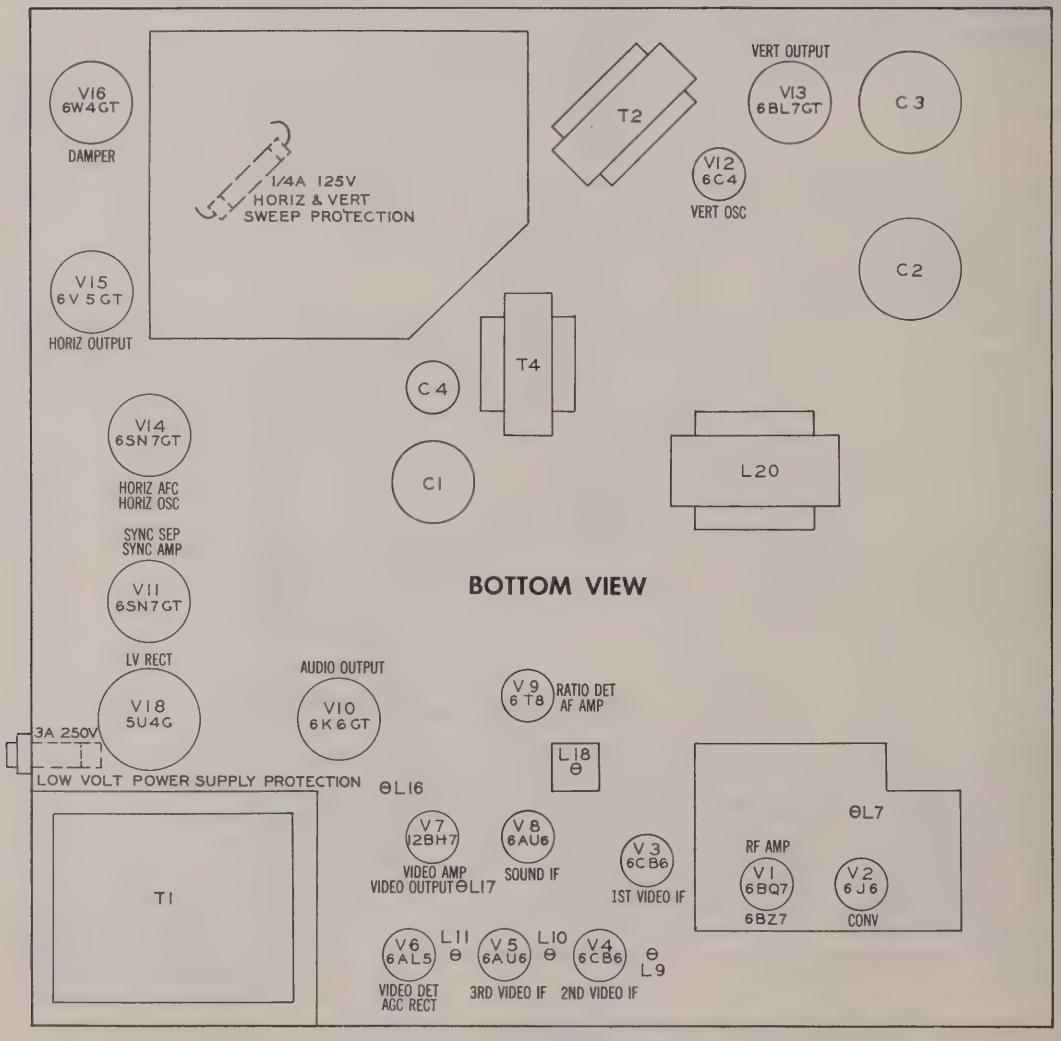
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
12.	.01MFD	High side to antenna stator lug. Low side to B-.	455KC.	Radio	Tuning gang fully open	Across voice coil	A24, A25 A26, A27	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
13.	"	Loop	1700KC	"	"	"	A28	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
14.		"	1400KC	"	Tune to 1400KC signal	"	A29	"

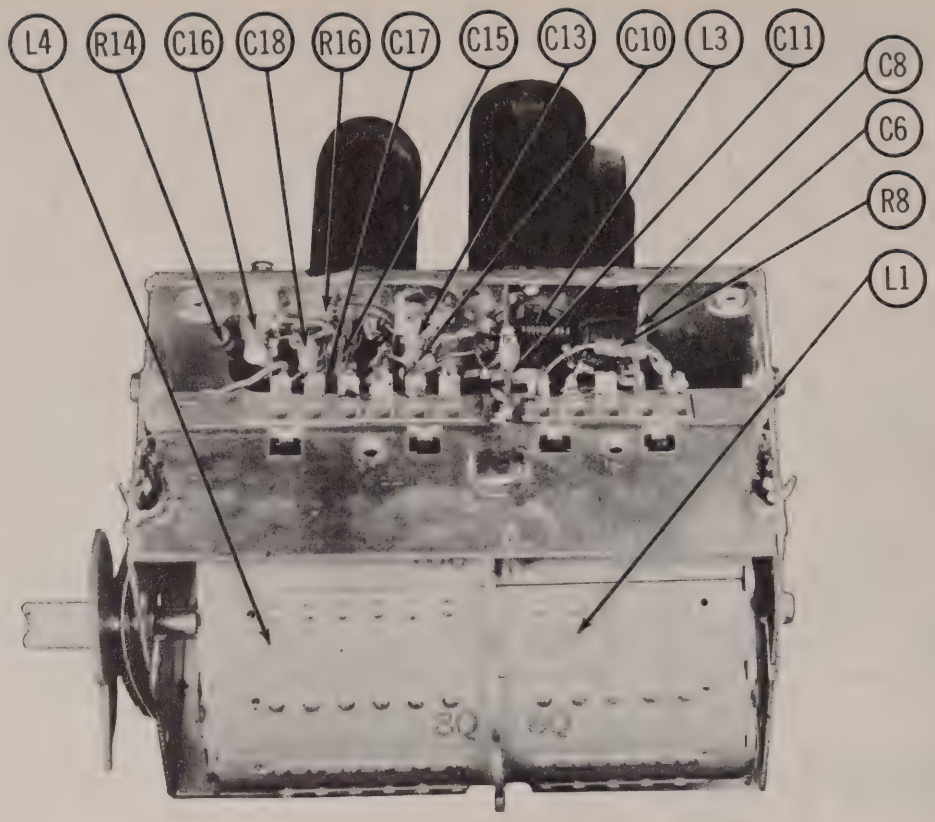
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	▲140KΩ	0Ω	.1Ω	0Ω	†3.7KΩ	130KΩ	INF	0Ω
V 2	6J6	†27KΩ	†12KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	1.3Meg	47Ω	0Ω	.1Ω	†4KΩ	†4KΩ	0Ω		
V 4	6CB6	1.3Meg	47Ω	0Ω	.1Ω	†4KΩ	†4KΩ	0Ω		
V 5	6AU6	.4Ω	0Ω	0Ω	.1Ω	†500Ω	†4KΩ	150Ω		
V 6	6AL5	.4Ω	680KΩ	.1Ω	0Ω	0Ω	0Ω	4.7KΩ		
V 7	12BH7	†5KΩ	39KΩ	330Ω	.1Ω	.1Ω	†15KΩ	4.7KΩ	4Ω	0Ω
V 8	6AU6	47KΩ	0Ω	0Ω	.1Ω	†1.3KΩ	†47KΩ	160Ω		
V 9	6T8	INF	18KΩ	INF	.1Ω	0Ω	0Ω	0Ω	10Meg	†500KΩ
V 10	6K6GT	INF	0Ω	†1.5KΩ	†900Ω	500KΩ	INF	.1Ω	560Ω	
V 11	6SN7GT	56KΩ	†1.5Meg	330KΩ	†1.5Meg	†9.5KΩ	5.6KΩ	.1Ω	0Ω	
V 12	6C4	#950KΩ	0Ω	0Ω	.1Ω	#950KΩ	†180KΩ	0Ω		
V 13	6BL7GT	2.2Meg	†1.8KΩ	1.2KΩ	2.2Meg	†1.8KΩ	1.2KΩ	.1Ω	0Ω	
V 14	6SN7GT	1.1Meg	†50KΩ	330KΩ	280KΩ	†50KΩ	0Ω	0Ω	.1Ω	
V 15	6AV5GT	1Meg	.1Ω	0Ω	INF	#48Ω	INF	0Ω	†5.7KΩ	
V 16	6W4GT	†530Ω	INF	500KΩ	†400Ω	†430Ω	INF	†72Ω	†72Ω	
V 17	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP #483Ω
V 18	5U40	INF	30KΩ	INF	29Ω	30KΩ	27Ω	30KΩ	30KΩ	
V 19	21EP4	0Ω	800KΩ	PIN 10 #470KΩ	PIN 11 †480KΩ	PIN 12 .1Ω				

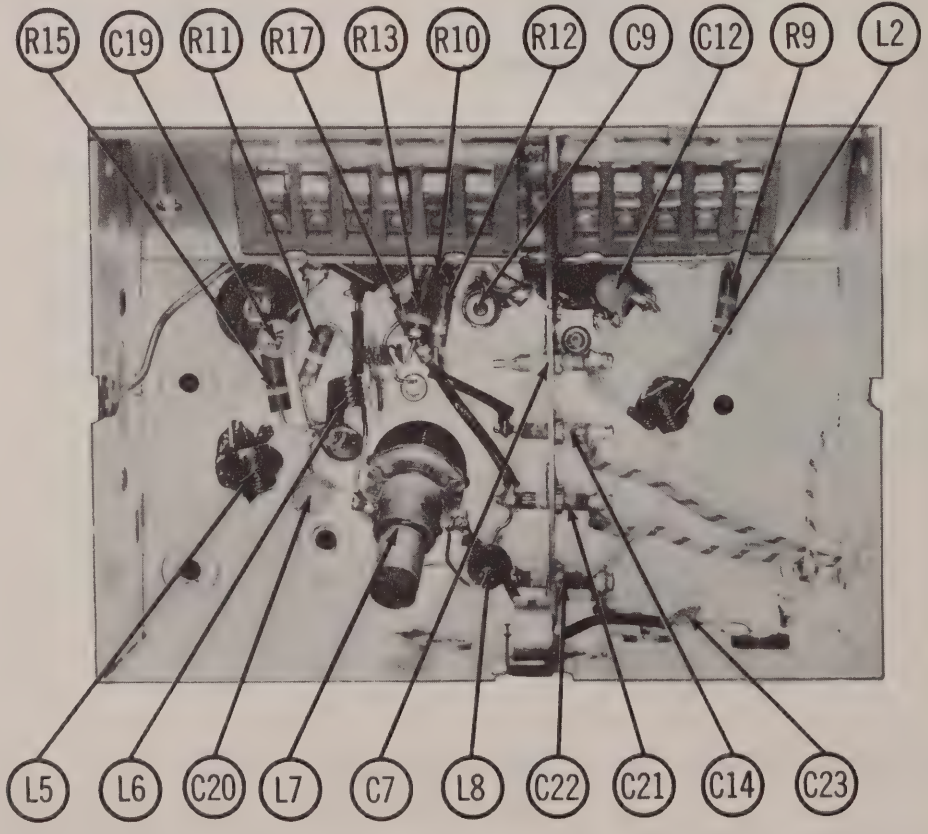
† MEASURED FROM PIN 8 OF V18
# MEASURED FROM PIN 3 OV V16
▲ MEASURED WITH M4 IN LOCAL POSITION



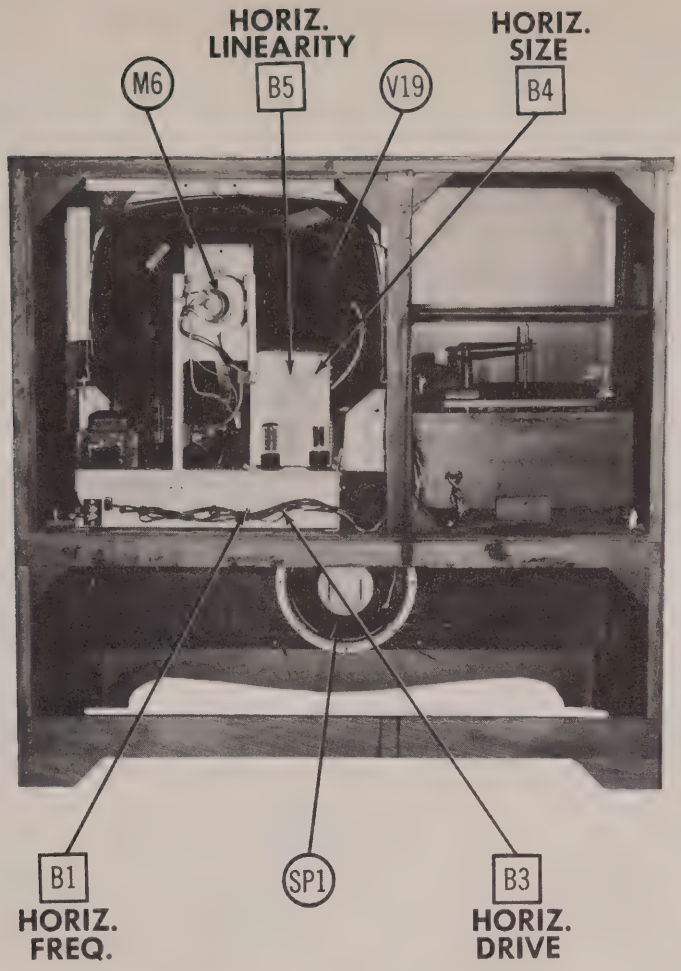
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



PROPERTY OF
L. F. [illegible] ARMENSHIP

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Turn the contrast control to its mid-position.

Turn the horizontal hold control fully counter clockwise.

If the picture is out of sync, adjust the horizontal frequency slug (B1) until the picture synchronizes.

Momentarily interrupt the signal by switching to another channel, then back. The picture should just fall out of sync. If it does not, turn B1 slightly clockwise and again interrupt the signal. Continue this procedure until the picture just falls out of sync only when signal is interrupted. Rotate the horizontal hold control clockwise until picture falls into sync. The picture should remain in sync throughout most of the range of the horizontal hold control. If picture does not hold sync it may be necessary to adjust the horizontal waveform slug, B2.

Connect the vertical amplifier of an oscilloscope through 10KΩ to terminal "C" of L19. Connect the low side to chassis. If necessary, adjust B2 to obtain waveform as in Fig. 7. During adjustment of B2 keep picture in sync by adjusting B1.

Adjust the horizontal drive trimmer, B3, counter clockwise until compression or vertical white line at center of the picture appears and then clockwise until compression or vertical white line just disappears.

Adjust the horizontal size slug, B4, for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug, B5, for a picture that is symmetrical from left to right.

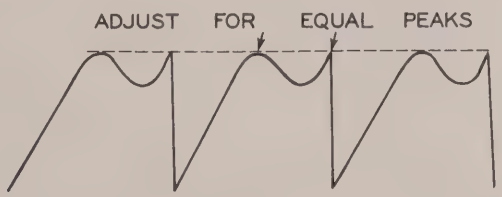


FIG. 7

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage".

INSUFFICIENT SWEEP

Check adjustment of B3, B4 and B5. Check by substitution V14, V15, V16 and V18. Check waveform at W14.

If Satisfactory	If Unsatisfactory
Check C73, C76, C77, C78, T3 T5A and other associated components.	Check C70, C71 , C72 and other associated circuit components.

COMPRESSED LEFT SIDE

Check adjustment of B3, B4 and B5. Check by substitution V14, V15 and V16. Check T3, T5A, C77, C78 and other associated components.

DRIVE LINES

Check adjust nent of drive trimmer (B3). Check by substitution V14, V15, and V16. Check T3, T5A, C77, C78, C70, C71, C72 and other associated components

FOLDS

Check by substitution V16, V15 and V14. Check T3, T5A and damper filter components.

XMAS TREE EFFECT

Substitute V14. Check adjustment of B1 and B2. Check L19, C69, C70, C71 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V12 and V13. Check waveform of W8.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R72, C3A and other associated components.	Check C58, C59, T2, R68, R69, R70 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check adjustment of height and vertical linearity controls. Follow procedure outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V12 and V13. Check associated circuit components especially C58, C59, R67, R68, R69, C1D and vertical size control.

COMPRESSED AT TOP

Check by substitution V12 and V13. Check associated circuit components especially C4A, vertical linearity control, R71, R72, C3A, T4 and T5B.

FOLDS

Check by substitution V12 and V13. Check T4, T5B, C3A, C4A, R71, R72 and associated components.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V14. Check adjustment of B1 and B2. Check waveform at W11.

If Satisfactory	If Unsatisfactory
Check L19, C69, C70, C71 and other components associated with the horizontal oscillator	Check C65, C74, R77, R78 and other associated circuit components.

CRITICAL HOLD

Substitute V14. Proceed as outlined under "Loss of sync".

HORIZONTAL PULL

Substitute V14. Check components that form the AFC filter especially C67 and C68.

VERTICAL

LOSS OF SYNC

Check by substitution V11 and V12. Check waveform at W6.

If Satisfactory	If Unsatisfactory
Check components associated with V12 especially T2, R66 and vertical hold control.	Check vertical integrator network and other components associated with V11.

CRITICAL HOLD

Substitute V11 and V12. Proceed as outlined under "Loss of Sync".

TRIGGERING

Substitute V11, V12 and V13. Check circuits near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Check C39, picture tube and other associated components.

SOUND BARS (4.5MC Beat)

Check local oscillator adjustment in RF tuner. Check adjustment of sound take-off (A5) and 4.5MC trap A23. Check video IF alignment.

NEGATIVE PIX

Check by substitution V6 and V7. Check associated components especially C33, C35 and C39. Check picture tube.

POOR CONTRAST

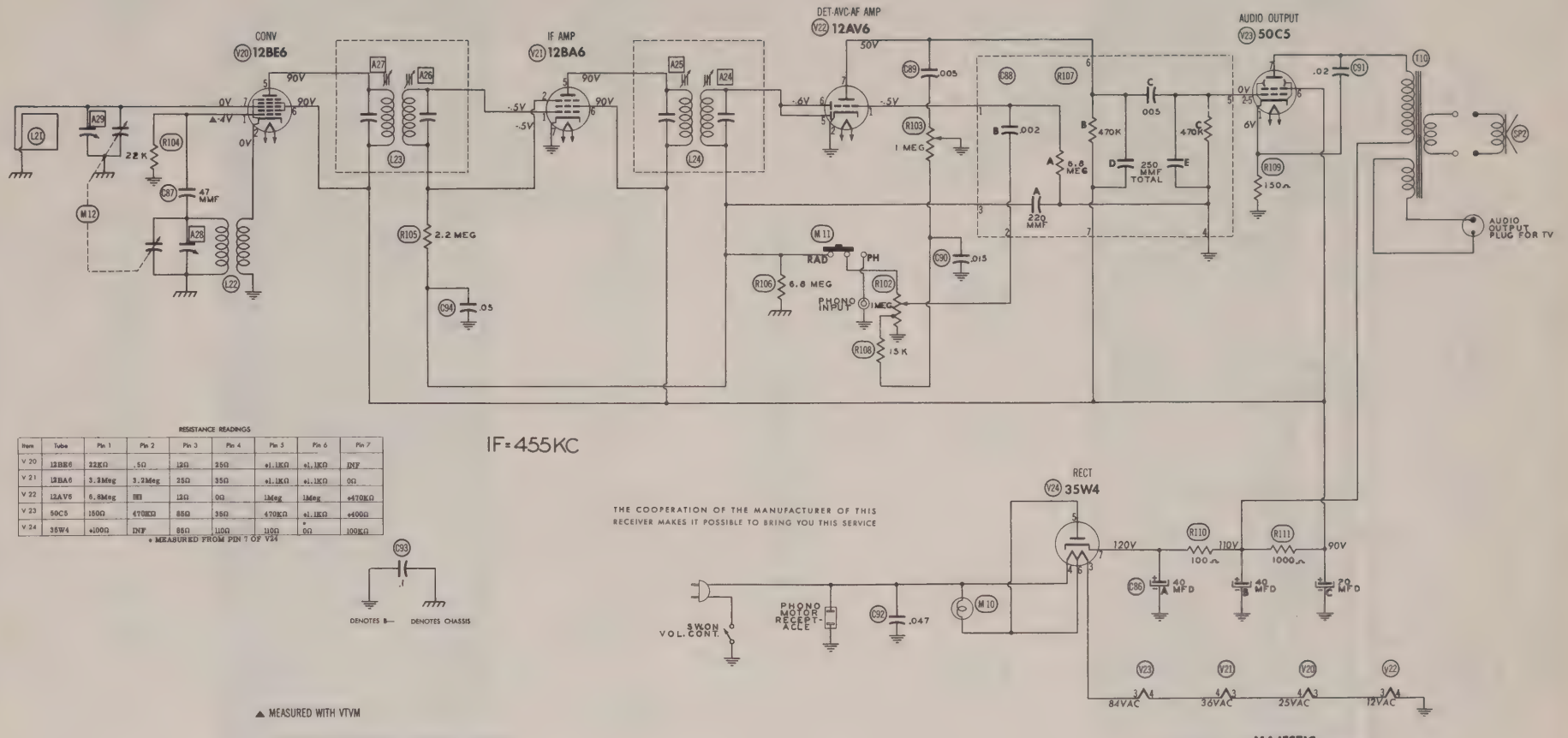
Check by substitution V6 and V7. Check video IF alignment. Check picture tube. Check components associated with these stages.

SMEAR

Check by substitution V6 and V7. Check C35 and C39. Check R35, R37, R39 and R41 for change of value. Check picture tube and other associated circuit components.

ONE WIDE BLACK BAR ACROSS PIX

Check RF tuner, video IF, video detector and video amplifier tubes for heater to cathode leakage.

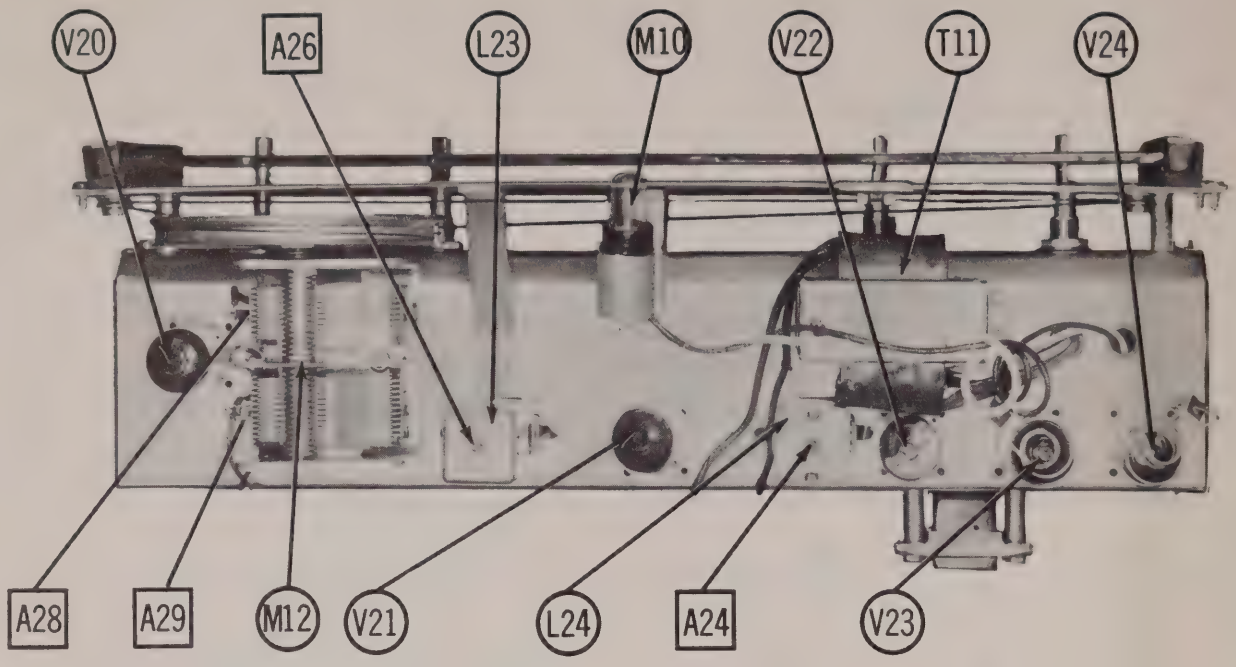


from	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 20	12BE6	22KΩ	.5Ω	12Ω	25Ω	+1.1KΩ	+1.1KΩ	INF
V 21	12BA6	3.3Meg	3.2Meg	25Ω	35Ω	+1.1KΩ	+1.1KΩ	0Ω
V 22	12AV6	6.8Meg	INF	12Ω	0Ω	1Meg	1Meg	+470KΩ
V 23	50C5	150Ω	470KΩ	85Ω	35Ω	470KΩ	+1.1KΩ	+400Ω
V 24	35W4	+100Ω	INF	85Ω	110Ω	110Ω	0Ω*	100KΩ

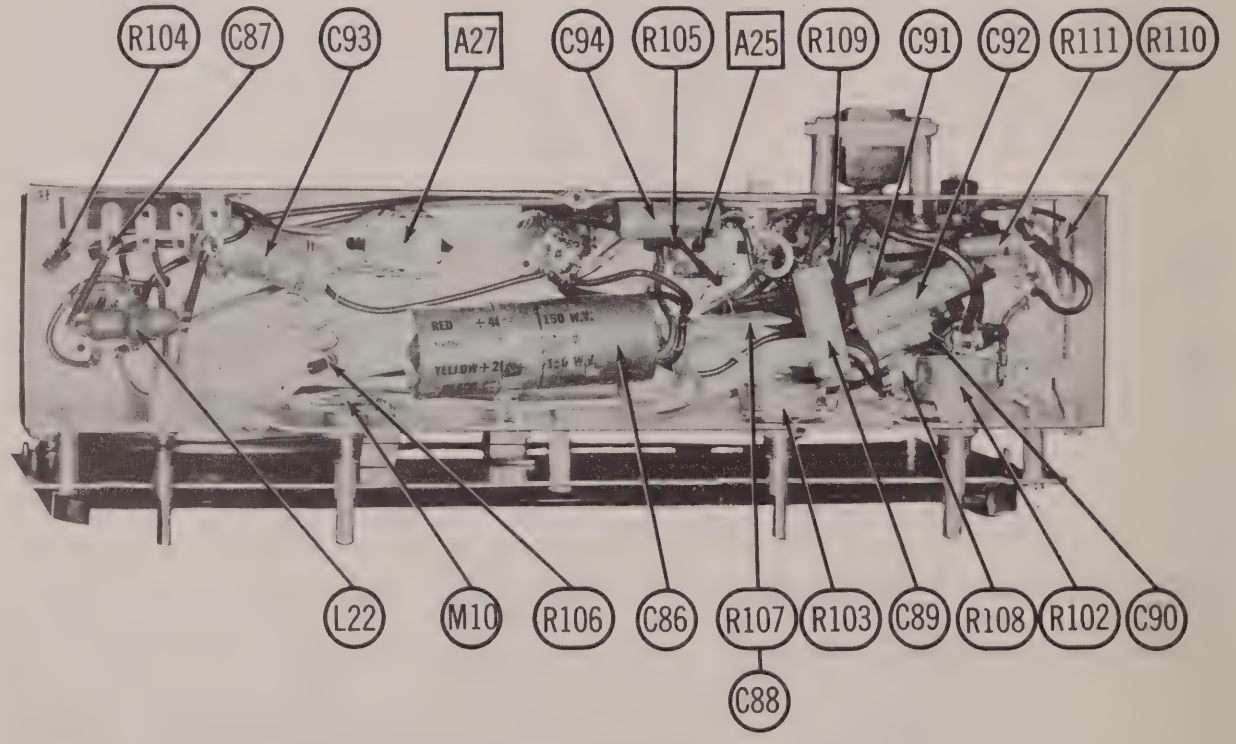
RADIO SCHEMATIC

MODELS 21P62, 21P63 (Series 110, 111)

MAJESTIC



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		MAJESTIC PART No.	STANDARD REPLACEMENT		
V1A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amplifier-Video Output	12BH7	12BH7	9BF	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V10	Audio Output	6K6GT	6K6GT	7S	
V11	Sync Separator-Sync Amplifier	6SN7GT	6SN7GT	8BD	
V12	Vert. Oscillator	6C4	6C4	6BG	
V13	Vert. Output	6BL7GT	6BL7GT	8BD	
V14	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6AV5GT	6AV5GT	6CK	
V16	Damper	6W4GT	6W4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	MAJESTIC PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.		
V19	21EP4A	21EP4A 21EP4 ① 21FP4 ① 21FP4A ①	21EP4A	12D 12D 12C 12C	① Circuit changes necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAJESTIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	450	C-3.435-3	E4D415		DO15		FP376.8 TC70	R1320	
B	■40	450								
C	▲4	450								
D	4	450								
C2A	■40	450	C-5.435-4	AFH3-43		CO34		FP376.8	TVL-3785	
B	▲40	450								
C	▲8	450								
C3A	▲40	450	C-5.435-1	AFH3-142		CO19		FP375	TVL-3764	
B	▲40	450								
C	■100	25								
C4A	■100	50	C-5.429-2	AFH3-12		CO11		FP229	R1319	
B	▲25	50								
C5	4	50	C-5.430-1	PRS150/4		BR415		TC30	TVA-1402	
C6	3-9				829-10					
C7	1000			CN-1-001	MFT-1000				503C-D1	
C8	3									
C9	.5-3				829-3			CT565A		
C10	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C11	1000			CN-1-001	MFT-1000				503C-D1	
C12	1000			BPD-001	DD-102	TM5D5	801-001	DC-521	5HK-D1	
C13	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C14	1000			CN-1-001	MFT-1000				503C-D1	
C15	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C16	.5-3				829-3			CT565A		
C17	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C18	5			SI5N750	TCN-5		N750K-050	NT-555	5TCUB-V5	
C19	1000			BPD-001	DD-102	TM5D1	801-001	DC-525	5HK-D5	
C20	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C21	1000			CN-1-001	MFT-1000				503C-D1	
C22	1000			CN-1-001	MFT-1000				503C-D1	
C23	120			BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C24A	5000		B-4.125-1	BPD-2X0047	DD2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	5000					TM5D5	811-005	DC-525		
C25A	5000		B-4.125-1	BPD-2X0047	DD2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	5000					TM5D5	811-005	DC-525		
C26	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C27	.22	400	D-3.105-23	P488-22		PTE4P22		PT4025	4TM-P22	
C28	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C29A	5000		B-4.125-1	BPD-2X0047	DD2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	5000					TM5D5	811-005	DC-525		
C30	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C31	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C32	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	100		C-4.109-10	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C34	10		C-4.109-16	SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C35	.22	400	D-3.105-23	P488-22		PTE4P22		PT4025	4TM-P22	
C36	100	500	D-4.104-38	1469-0001		5R5T1		MCB235	MS-31	
C37	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C38	100	500	D-4.104-38	1469-0001		5R5T1		MCB235	MS-31	
C39	.1	400	D-3.105-21	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C40	39	500	D-4.104-21	1469-00004		5R5Q4		MCB233	MS-44	
C41	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C42A	5000		B-4.125-1	BPD-2X0047	DD2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	5000					TM5D5	811-005	DC-525		

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	MAJESTIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C43	1500		D-4.108-12	BPD-0015	DD-152	TMSD15	801-0015	DC-5215	5HK-D15	
C44	1500		D-4.108-12	BPD-0015	DD-152	TMSD15	801-0015	DC-5215	5HK-D15	
C45	.047	400	D-3.105-19	P488-047	DF-503	PTE4S47		PT4147	47M-S47	
C46	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C47	680		C-4.109-5	EH680	D6-681		GP2K-681	UC-5368	5GA-T68	
C48A	.01									
B	350				*PC-80		*1404-01		*102C1	
C										
C49	.0047	600	D-3.105-28	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C50	1500		D-4.108-12	BPD-0015	DD-153	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C51	.22	400	D-3.105-23	P488-22		PTE4P22		PT4225	4TM-P22	
C52	220		C-4.109-11	EH220	D8-221		GP2K-221	UC-5322	5GA-T22	
C53	.0022	400	D-3.105-12	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C54	.022	400	D-3.105-17	P488-022	DF-203	PTE4S22		PT4223	4TM-S22	
C55	.0022	400	D-3.105-12	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C56A	.002			P688-002		PTE6D2		PT622		
B	.005		TB-10.101	P688-005	†PC-100	PTE6D5	†1405-01	PT625	†101C1	
C	.005			P688-005		PTE6D5		PT625		
C57	4700	500	D-4.105-24	1464-005		IDR5D5		MCB465	M6-25	
C58	.047	600	D-3.105-34	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C59	.035	600								
C60	.22	400	D-3.105-23	P488-22		PTE4P22		PT4025	4TM-P22	
C61	.1	400	D-3.105-21	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C62	.047	600	D-3.105-34	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C63	.22	400	D-3.105-23	P488-22		PTE4P22		PT4025	4TM-P22	
C64	68	500	D-4.104-93	1469-00007		SH5Q7			MS-47	
C65	.0022	600	D-3.105-28	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C66	.047	400	D-3.105-19	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C67	.25	200	D-3.100-30	P288-25		PTF2P25		PT4025	2TM-P25	
C68	.033	400	D-3.105-17	P488-033	DF-303	PTE4S22		PT4122	4TM-S22	
C69	330	500	D-4.104-89							
C70	.01	600	D-3.106-1						20GA-Q39	
C71	1200	500	D-4.105-9						20GA-Q66	
C72	560	500	D-4.104-70						20DK-T5	
C73	.047	600	D-3.105-34	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C74	47		C-4.109-14	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C75	47		C-4.109-14	SI47	D8-470		GP1K-470	UC-5447	5GA-Q47	
C76	.25	200	D-3.100-30	P288-25		PTF2P25		PT4025	2TM-P25	
C77	.047	600	D-3.105-34	P688-047		PTE6S47		PT6147	6TM-S47	
C78	.035	600	D-3.100-46							
C79	39	2000	B-4.129-3						20GA-Q39	
C80	68	2000	B-4.129-4						20GA-Q68	
C81	500	20000	B-4.128	HV20C	TV3-502	MM-C20T5	413-501	HV20035A	20DK-T5	
C82	68	2000	B-4.129						20GA-Q68	
C83	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C84	5000		B-4.115-1	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C85	.0047	600	D-3.105-28	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	Note 2

Note 1. Used in combination models only.
Note 2. Not used in all Models.
* Items C48A, C48B, C48C, R55A, R55B are combined in one unit.
When replacing items separately C48B and C48C should total 250MMF.
† Items C58A, C58B, C58C. R65A, R65B, R65C are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	MAJESTIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	C-8.230-1	QJ-8 *	R-TV-333		UP152L	Contrast-Panel
B	1Meg	½					UR16A	Volume-Rear
C	Switch						UB-26	Attach to R1B
R2	2250Ω	4	C-8.221		R-TV-319			Focus-Wire Wound
R3A	1.5Meg	½	C-8.239-10	QU-138	AG-82-8	AB-75	U-185	Vert. Hold
B	Shaft		Not Req.	Not Req.	KB6-3	AK-4	Not Req.	Attach to R3A
R4A	5000Ω	2	C-8.205-8	WK-5000	A43-5000		R5000L	Vert. Linearity-Wire Wound
B	Shaft		Not Req.	Not Req.	FKB-1/4		Not Req.	Attach to R4A
R5A	100KΩ	½	C-8.239-9	QU-139	AG-49-8	AB-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KB6-3	AK-4	Not Req.	Attach to R5A
R6A	2.5Meg	½	C-8.215-5	QU-239	AG-84-8	AB-29	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	FKB-1/4	AK-1	Not Req.	Attach to R6A
R7A	50KΩ	½	C-8.239-7	QU-133	AG-44-8	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KB6-3	AK-4	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BARE ELEMENTS & SHAFTS B11-106 & P1-126 (Panel)
B13-137 & R1-210 (Rear) & SWITCH 78-1.
† UNIVERSAL REPLACEMENT - (Mallory exact duplicate part #UE2086)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	MAJESTIC PART No.	IRC PART No.	NOTES
R8	15KΩ	½		BTS-15K	
R9	47KΩ	½		BTS-47K	
R10	100KΩ	½		BTS-100K	
R11	150KΩ	5%		BTS-150K 5%	
R12	1500Ω	½		BTS-1500	
R13	100KΩ	5%			
R14	10KΩ	½			
R15	220KΩ	½			
R16	10KΩ	½		BTS-10K	
R17	15KΩ	½		BTS-15K	
R18	2200Ω	1	D-7.102-38	BTA-2200	
R19	12KΩ	2	D-7.102-132	BTS-12K	
R20	100KΩ	½	D-7.101-100	BTS-100K	
R21	330Ω	½	D-7.101-237	BTS-330	
R22	4700Ω	½	D-7.101-44	BTS-4700	
R23	47Ω	½	D-7.101-250	BTS-47	
R24	100Ω	½	D-7.101-226	BTS-100	
R25	5200Ω	½	D-7.101-55		
R26	47Ω	½	D-7.101-250	BTS-47	
R27	100Ω	½	D-7.101-226	BTS-100	
R28	12KΩ	½	D-7.101-62		
R29	150Ω	½	D-7.101-248	BTS-150	
R30	100Ω	½	D-7.101-226	BTS-100	
R31	150Ω	½	D-7.101-204	BTS-150	
R32	680KΩ	½	D-7.101-124	BTS-680K	
R33	680KΩ	½	D-7.101-134	BTS-680K	
R34	4700Ω	½	D-7.101-44	BTS-4700	
R35	3300Ω	½	D-7.101-37	BTS-3300	
R36	22KΩ	2	D-7.103-143	BTS-22K	
R37	47KΩ	½	D-7.101-86	BTS-47K	
R38	39KΩ	½	D-7.101-83	BTS-39K	
R39	330Ω	½	D-7.101-227	BTS-330	
R40	10KΩ	½	D-7.101-58	BTS-10K	
R41	2700Ω	2	D-7.103-104	BTS-2700	
R42	2700Ω	2	D-7.103-104	BTS-2700	
R43	1000Ω	½	D-7.101-17	BTS-1000	
R44	470KΩ	½	D-7.101-129	BTS-470K	
R45	470KΩ	½	D-7.101-129	BTS-470K	Note 1

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	MAJESTIC PART No.	IRC PART No.	NOTES
R46	47KΩ	½	D-7.101-87	BTS-47K	
R47	47KΩ	½	D-7.101-87		
R48	100Ω	½	D-7.101-226	BTS-100	
R49	47KΩ	½	D-7.101-86		
R50	1000Ω	½	D-7.101-17	BTS-1000	
R51	220Ω	½	D-7.101-234	BTS-220	Note 4
R52	15KΩ	½	D-7.101-66	BTS-15K	
R53	18KΩ	½	D-7.101-69	BTS-18K	
R54	10Meg	½	D-7.101-193	BTS-10Meg	
R55A	500KΩ	½	*		
B	500KΩ	½			
R56	560Ω	1	D-7.102-13	BTA-560	
R57	470Ω	1	D-7.102-10	BTA-470	
R58	56KΩ	½	D-7.101-90	BTS-56K	
R59	330KΩ	½	D-7.101-121	BTS-330K	
R60	1.5Meg	½	D-7.101-148	BTS-1.5Meg	
R61	5600Ω	½	D-7.101-48	BTS-5600	
R62	2200Ω	½	D-7.101-30	BTS-2200	
R63	3300Ω	½	D-7.101-37	BTS-3300	
R64	33KΩ	½	D-7.101-80	BTS-33K	
R65A	22KΩ	½		BTS-22K	
B	8200Ω	½	TB-10.101	BTS-8200	
C	8200Ω	½		BTS-8200	
R66	1.2Meg	½	D-7.101-145	BTS-1.2Meg	
R67	100Ω	½	D-7.101-56	BTS-100	Note 3
R68	470KΩ	½	D-7.101-129	BTS-470K	
R69	330KΩ	½	D-7.101-122	BTS-330K	
R70	2.2Meg	½	D-7.101-156	BTS-2.2Meg	
R71	470Ω	3	D-7.101-3	BTS-470	
R72	1000Ω	1	D-7.102-24	BTA-1000	
R73	560Ω	½	D-7.101-6	BTS-560	
R74	560Ω	½	D-7.101-7	BTS-560	
R75	100KΩ	1	D-7.102-108	BTA-100K	
R76	47KΩ	1	D-7.102-94	BTA-47K	
R77	3.3Meg	½	D-7.101-171	BTS-3.3Meg	
R78	820KΩ	½	D-7.101-138	BTS-820K	
R79	150KΩ	½	D-7.101-107	BTS-150K	
R80	180KΩ	½	D-7.101-111	BTS-180K	
R81	8200Ω	½	D-7.101-55	BTS-8200	
R82	100KΩ	5%	D-7.101-99	BTS-100K 5%	
R83	8200Ω	½	D-7.101-55	BTS-8200	
R84	47KΩ	1	D-7.102-94	BTA-47K	
R85	1000Ω	1	D-7.102-24	BTA-1000	
R86	470KΩ	½	D-7.101-128	BTS-470K	
R87	1Meg	½	D-7.101-142	BTS-1Meg	
R88	100Ω	½	D-7.101-226		
R89	5600Ω	2	D-7.103-118	BTS-5600	
R90	150Ω	1	D-7.102-214	BTA-150	
R91	470KΩ	½	D-7.101-128	BTS-470K	
R92	2.2Meg	½	D-7.101-156	BTS-2.2Meg	
R93	3.3Ω	½	C-8.212-1		
R94	470KΩ	½	D-7.101-137		
R95	470Ω	7	C-8.215-5		
R96	1800Ω	2	D-7.103-57	BTB-1800	Note 3
R97	8750Ω	10	B-8.211-5		
R98	12Ω	1	D-7.102-222		Note 3
R99	470Ω	½	D-7.101-2	BTS-470	
R100	100KΩ	½	D-7.101-100	BTS-100K	
R101	1.5Meg	½	D-7.101-148	BTS-1.5Meg	Note 3

Note 1. Some Models may use a 330KΩ resistor in this application.
Note 2. Some Models may use a 6800Ω resistor in this application.
Note 3. Not used in all Models.
Note 4. Used only with Ratio Det. Transformer part #1.552-1.
* Items R55A, R55B, C48A, C48B, C48C are combined in one unit.
† Items R65A, R65B, R65C, C56A, C56B, C56C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	MAJESTIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ⑪1.64A	810CYCT 5VAC ⑪.330ADC		6.3VAC ⑪1.2A	D-9260		P-3055	TP-319①		
				2EC. 4 6.3VAC ⑪4.4A						

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	MAJESTIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	170Ω	1000Ω	C-9.230-4	A-8125	A-3003	TSO-5	A-97X		Vert. Osc. Trans.
T3	367Ωtap ⑪32Ω	17.6Ω tap ⑪14.2Ω 2EC. 2	C-9.259-1	A-8130 ①	HVO-10①	TFB-9	D-31 ⑯		Horiz. Output Trans.
T4	720Ω	0Ω 8Ω	C-9.228-5	A-8112	A-3036	TSO-8	A-99X ⑦		Vert. Output Trans.
T5A	31Ω		C-9.264-3L	DY-11A ④ ⑤	MDF-73 ⑤	TT-8 ⑤	Y-33 ⑤ ⑦		Horiz.Deflection Coils
B	56Ω		C-9.254-3 ⑪						Vert. Deflection Coils
T6	395Ω		C-9.234-4K	FC-12	MF-3		B-395-8		Focus Coil
T7	22Ω		B-1.531	WC-5 ⑦	MWC-6	TW-7	WC-12 ⑧		Horiz. Linearity Coil
T8	28Ω		B-1.533-1	WC-5 ⑦ ⑫	MWC-10 ⑫	TL-4 ⑫	WC-11 ⑫		Width Coil

① Wire as in original circuit except connect original terminal #7 to new terminal #3, original #8 to new #5.
② Connect terminal #6 to terminal #3, then connect damper plate and hot side of yoke to terminal #4,
connect width coil across terminal #4 and #5, connect original terminal #7 to new terminal #3, original #1
to new #1, original #6 to new #7.
③ Drill one new mounting hole.
④ Use original horizontal deflection coil network if necessary.
⑤ Use original yoke cover and positioning device.
⑥ Use original deflection coil network.
⑦ Connect to coded black and orange terminals.
⑧ Connect to coded blue and red terminals.
⑪ Drill new mounting hole.
⑫ See instruction sheet packed with unit for terminal connections.
⑯ Alternate deflection yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	MAJESTIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T9	5KΩ	3.2Ω	400Ω	.5Ω		A-3877	A-2930	RO-9	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	MAJESTIC PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.2Ω		ST-108 Mod. P6-X	6A15	Used in TV only Series 110 (See radio parts for Series 111 listings)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	MAJESTIC PART No	MEISSNER PART No	MERIT PART No	MILLER PART No.	NOTES
L1	Ant. Coils	0Ω CT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neutr. Coil	0Ω						
L4	RF, Mixer Grid & Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	1st. Video IF	1Ω						
L8	RF Choke	1.2Ω						
L9	2nd. Video IF	.4Ω	.4Ω	C-1.553	17-1063		6249	
L10	3rd. Video IF	.4Ω	.4Ω	C-1.553	17-1063		6249	
L11	4th. Video IF	.4Ω	.4Ω	C-1.553	17-1063		6249	
L12	Shunt Peaking Coil	14Ω		C-1.522-2	19-3500	TV-188	6174	470 Microhenries
L13	Series Peaking Coil	7Ω		C-1.523-4	19-3125		6153	126 Microhenries
L14	Shunt Peaking Coil	7Ω		C-1.523-4	19-3125		6153	.26 Microhenry
L15	Shunt Peaking Coil	7Ω		C-1.522-4	19-3125		6153	.36 Microhenry
L16	4.5MC Trap	1.3Ω		C-1.555	20-1004	TV-151	1470	Tapped ⑥ .4Ω
L17	Sound IF	.9Ω		C-1.554	17-3402			Tertiary winding -.6Ω
L18	Ratio Det.	5Ω	1.8Ω CT	C-1.528-1	17-3497	TV-115	6205	Primary tapped ⑥95Ω
L19	Horiz. Osc.	130Ω		C-1.549	20-1402	TV-162	6183	Horiz. waveform winding -35Ω

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D C RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~	MAJESTIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No	TRIAD PART No
L20	.230 ADC	72Ω	2.5Hy.	C-9237-3	C-2325 ①	C-2991	TR-3300 ①	C-21X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	MAJESTIC PART No FUSE	MAJESTIC PART No HOLDER	LITTELFUSE PART No FUSE	LITTELFUSE PART No HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M1	3AG	1/4 Amp 250 V.			318.250 (1/4A -3AG-P/T)		GJV 1/4	
M2	3AG	3Amp. 250V.			312003. (3A-3AG	342001	AGC 3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	MAJESTIC PART No.	NOTES
M3	RF Tuner		
M4	Switch		Local-Distance Selector (DPDT)
M5	Switch		TV-Phono (Used in Series 110)
M6	Ion Trap Magnet	36.144-2	
M7	Thermal Relay		B+ Delay (Not used in all models)
B3	Trimmer	B-4.118-2	40-370MMF (Horiz Drive)

MAJESTIC
MODELS 21P62, 21P63 (Series 110, 111)

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		MAJESTIC PART No.	STANDARD REPLACEMENT		
V20	Converter	12BE6	12BE6	7CH	
V21	IF Amplifier	12BA6	12BA6	7BK	
V22	Det.-AVC-AF Amp	12AV6	12AV6	7BT	
V23	Audio Output	50C5	50C5	7CV	
V24	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAJESTIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C86A	40	150		PRS150/50-30-20		EDL44215		3N532	TVA-3448	Red
B	40	150								Blue
C	20	150								Green
C87	47			SI47N750	TCN-47		N750L-470	NT-5447	5TCU-Q47	
C88A	220									
B	.002									
C	.005		*		*PC-150		* 1408-01		*103C4	
D	250									
E										
C89	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C90	.015	600		P688-015		PTE6S15		PT6115	6TM-S15	
C91	.02	400		P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C92	.047	400		489ZX-05		PJ4S47		PT4147	4TM-S47	
C93	.1	400		P488-1		PTE4P1		PT401	4TM-P1	
C94	.05	200		P288-05	DF-503	PJ455		PT415	4TM-S5	

* Items C88A, C88B, C88C, C88D, C88E, R107A, R107B, R107C are combined in one unit.
When replacing items separately C88D and C88E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAJESTIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R102A	1Meg	½	C-8.227-3	Q19-137X		BT-71-S	UT-443	Volume-Tapped @ 500KΩ
B	Switch		Not Req.	76-1		Not Req.	US-26	Attach to R102A
R103A	1Meg	½	C-8.227-4	Q11-137	AG-61-S	B-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R103A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAJESTIC PART No.	IRC PART No.	
R104	22KΩ	½		BTS-22K	
R105	2.2Meg	½		BTS-2.2Meg	
R106	6.8Meg	½		BTS-6.8Meg	
R107A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	*	BTS-470K	
C	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAJESTIC PART No.	IRC PART No.	
R108	15KΩ	½		BTS-15K	
R109	150Ω	½		BTS-150	
R110	100Ω	1		BTA-100	
R111	1000Ω	1		BTA-1000	

* Items R107A, R107B, R107C, C88A, C88B, C88C, C88D, C88E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MAJESTIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T10	10.9KΩ	3.2Ω	645Ω	.42Ω	C-9.225-4					
	PRI. 2		PRI. 2							
	3.1KΩ		296Ω							

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MAJESTIC PART No.	VIKING PART No.	QUAM PART No.	
SP2	10"	PM	3.2Ω	30.333	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MAJESTIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L21	Loop Ant.	3.2Ω		D-1.559				
L22	Osc. Coil	.6Ω	5Ω				70-Osc.*	
L23	Input IF	14Ω	16Ω	C-1.445-2	16-6758	BC-352	12-C1	
L24	Output IF	9Ω	9Ω	C-1.445-6	16-6758	BC-353	12-C2	

* Disregard tap on secondary winding.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	MAJESTIC PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M8		ACD-J	A-1 A-3	W22AB	A65MG A62A	96-0	0-1 0-3	

ASTATIC, SHURE AND ELECTRO VOICE NEEDLE LISTING SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

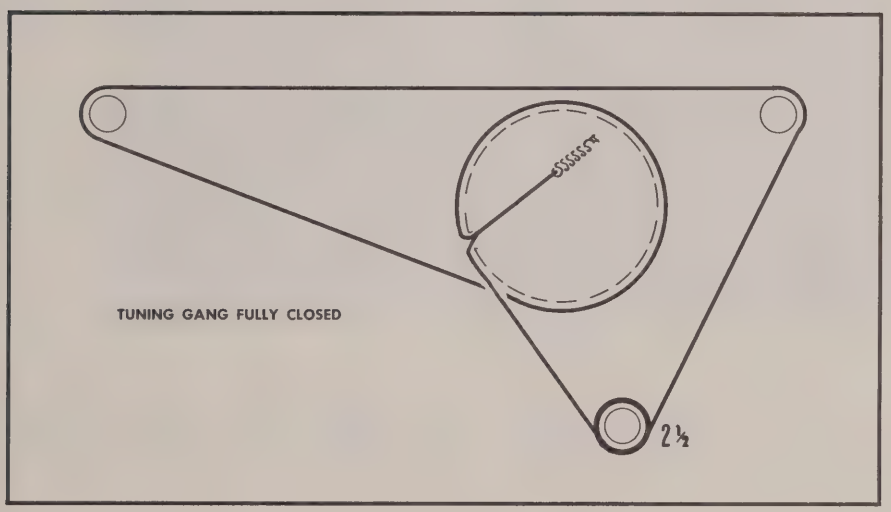
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

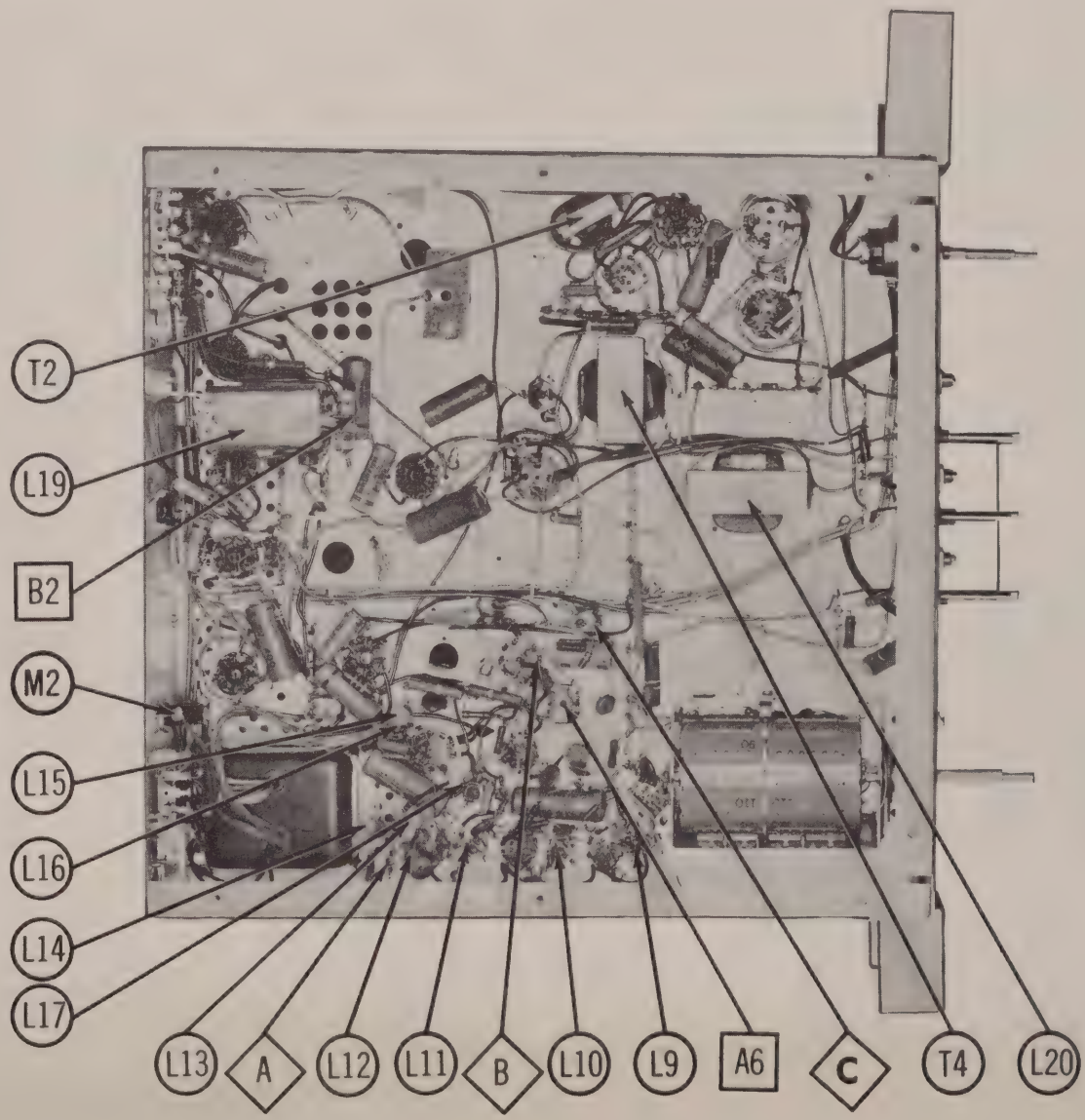
ITEM No.	REPLACEMENT DATA			REMARKS
	MAJESTIC PART No.	WALCO PART No.	JENSEN PART No.	
M9		W-5MGA or W-5MGS and W-5A or W-5S	A-75LP or A-85LP and A-75 or A-85	

MISCELLANEOUS

ITEM No.	PART NAME	MAJESTIC PART No.	NOTES
M10	Dial Light		Type #47
M11	Switch		Radio-Phono Switch
M12	Tuning Cap.	C2.226	30-390MMF, 35-195MMF



DIAL CORD STRINGING



TV CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9 and V10. Check stages of V9B and V10 using audio signal generator. Apply signal across R54.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V9 and V10, C48, T9 and SP1.

BUZZ

Set adjustment of ratio detector transformer secondary for minimum buzz. If buzz is still objectionable, substitute V9 and readjust A6 and A7. Check C5 and other associated components.

DISTORTED

Check by substitution V8, V9 and V10. Proceed as outlined under "Weak or No Sound".

L. F. B... 3924 ... DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check fuse M1, AC interlock assembly and switch on volume control. If filaments light, check V18 and B+ filter and decoupling network.

SMALL AND/OR DIM RASTER

Substitute V18. Check B+ filter and decoupling network. Check horizontal sweep circuit.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M2. Check by substitution V14, V15, V16 and V17. Check waveform at W14.

If Satisfactory	If Unsatisfactory
Check C73, C76, C77, C78, T3, T5A and R89. Check other associated circuit components.	Check C70, C71, C72, R85 and R87. Check other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V14, V15, V16, V17 and V18. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V17, V16, V15, V14 and V18. Check T3, T5A, R93, R94, C81, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check associated components.

NO RASTER NO SOUND

See "Dead Set".

TOTAL LOSS OF SYNC

Substitute V11. Check associated components especially all coupling and bypass capacitors.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

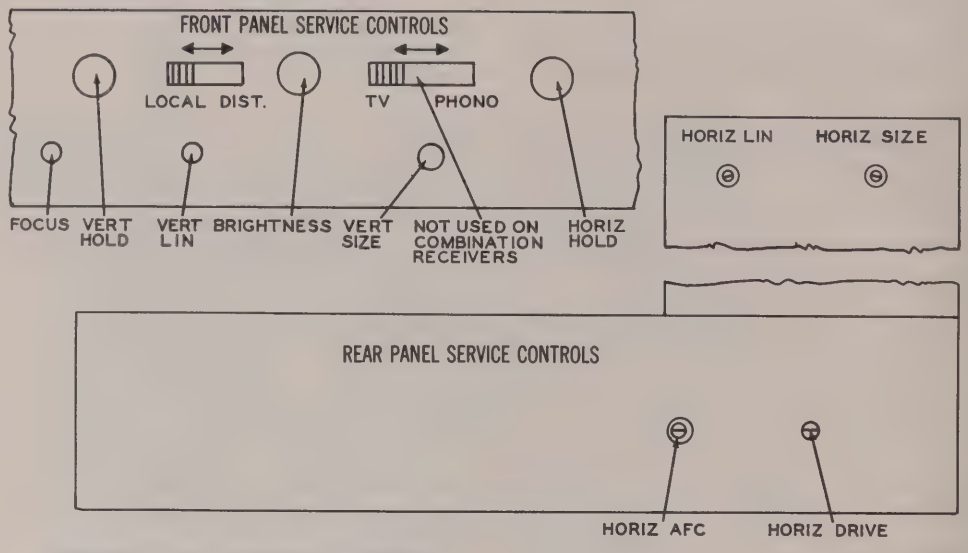
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 metal screws (one at each corner of safety glass). Remove safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L19) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L18) located on top of chassis. (See tube placement chart).

FUSES

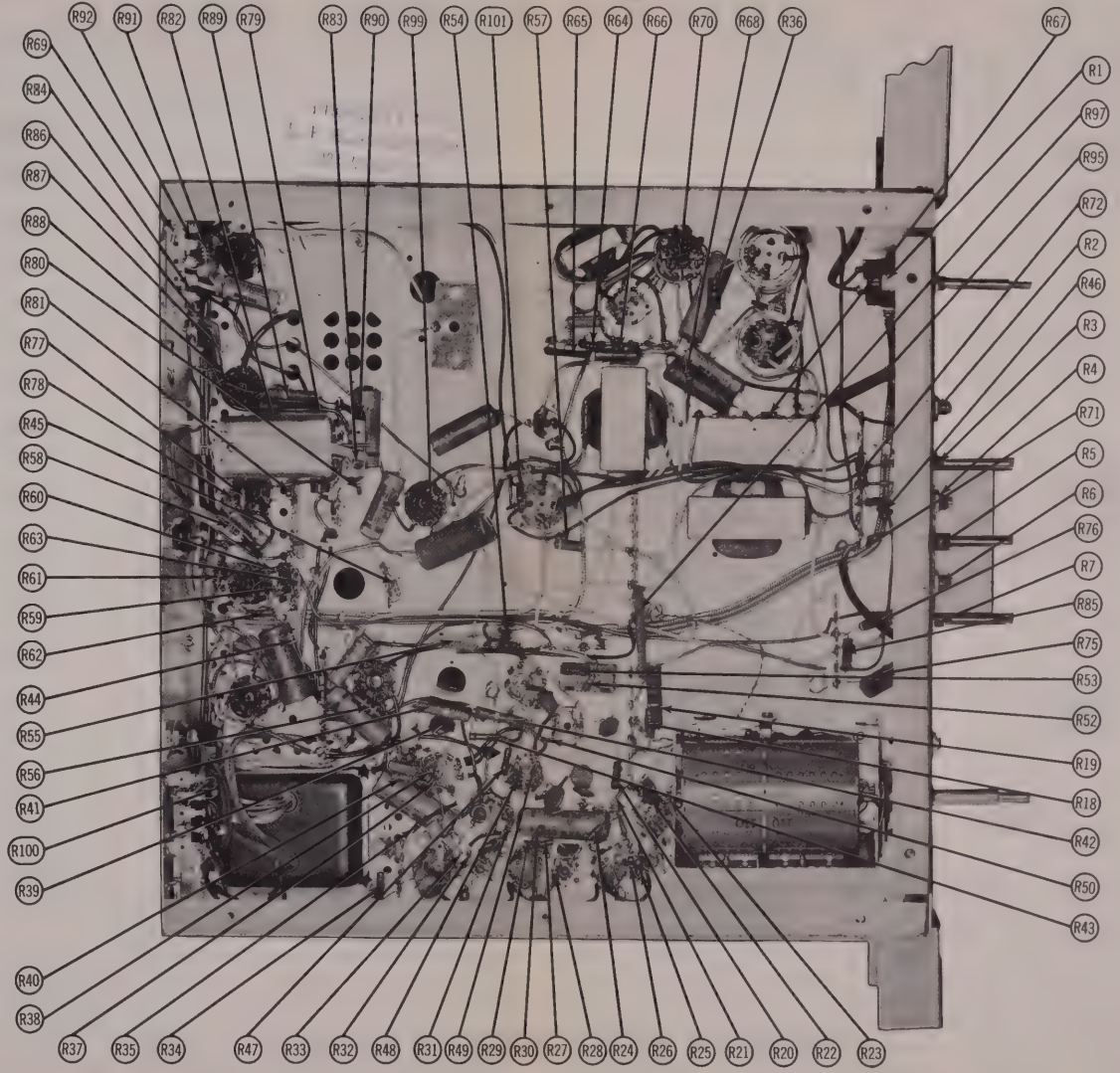
Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location see tube placement chart).

CENTERING

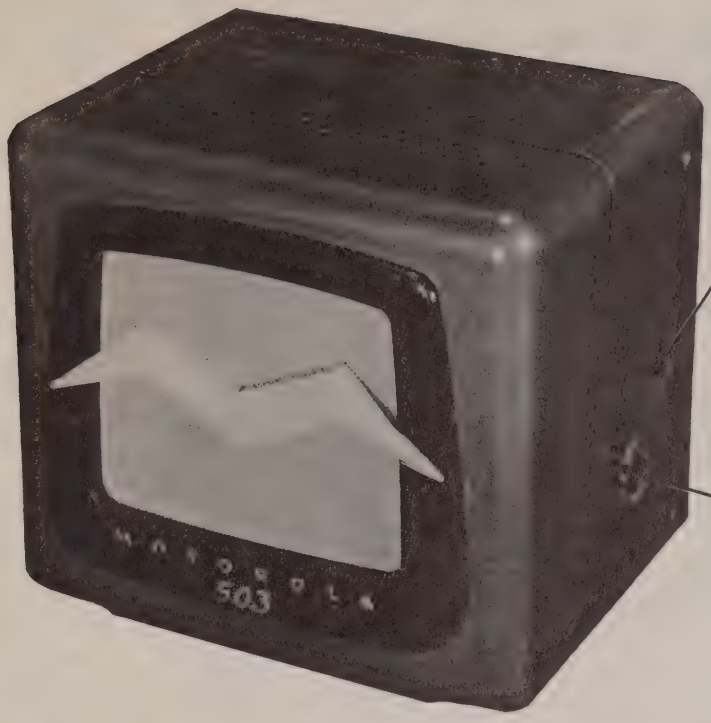
Centering is accomplished mechanically by positioning the focus coil. Loosen wing nuts located on top and sides of focus coil mounting bracket. Move focus coil until picture is properly centered. Be sure to tighten wing nuts securely after picture is centered.

DISASSEMBLY INSTRUCTIONS

TV	RADIO
Remove 4 push on type control knobs from front panel.	Remove clip and pins from record changer slides.
Remove 3 metal screws. Lift up and remove rear cover.	Remove entire phono unit from cabinet.
Disconnect built-in antenna, speaker, AC plug (to phono), Audio plug.	Remove 5 wood screws. Remove bottom cover.
Remove 2 metal screws. Remove AC input (to TV) from metal strip at top of cabinet.	Remove 4 push on type control knobs from front panel.
Remove 8 chassis bolts. Remove chassis.	Remove 3 wood screws and clamps.
Remove 4 speaker nuts. Remove 2 nuts on lower side of CRT.	Remove 1 wood screw and speaker lead bracket.
	Disconnect audio and phono motor plugs and loop antenna leads.
	Remove 4 metal screws holding chassis mounting board in compartment. Remove from compartment.
	Remove 3 chassis bolts. Remove chassis from mounting board.



TV CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



DENVER, COLORADO

MOTOROLA
MODEL 503

MOTOROLA
MODEL 503

TRADE NAME	Motorola Model 503
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated AM Superheterodyne Automobile Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det. -AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 4.9 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540 - 1605 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to give an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1 Mfd.	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~ Mod)	High freq. end stop.	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output in order given.
2.	Fig. 1	High side thru dummy ant. to ant. receptacle. Low side to chassis.	1610KC	"	"	A5, A6, A7	If necessary, pre-set coil cores to project 1-1/8" from cans. Adjust for maximum output in order given.
3.	"	"	1425KC	Tune to 1425KC signal. See Fig. 2.	"	A8, A9, A10	Adjust for maximum output in order given.

With receiver installed in car, antenna fully extended, tune in station near 1400KC and adjust A7 for maximum output.

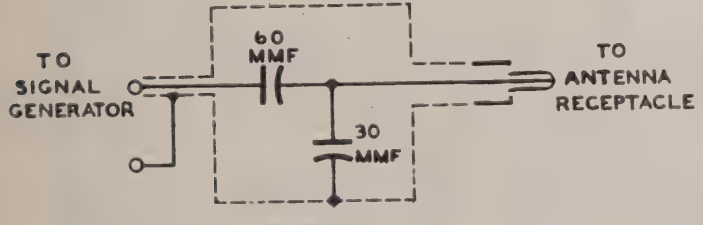


FIG. 1

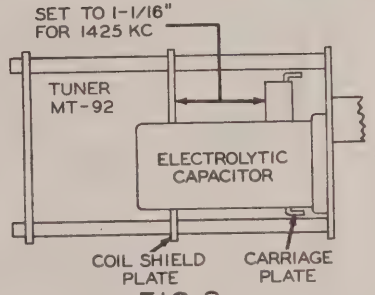


FIG. 2

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 503

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	6BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	15	350	23A485677	AFH3-104		CO77		FP328	TVL-3630	
B	10	350								
C	20	25								
C2	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S47	
C3	90		218591682							
C4	.006	100	8A4529	P285-006		PTE6D6	GP2-333-602	PT626	6TM-D6	
C5	5		21K70720	SI5	D6-050		GP1K-050	ZT-555	5GA-V5	
C6	50		21R6513	SI50	D6-500		GP1K-500	UC-545	5GA-Q5	
C7	.1	400	8R13166	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C8	.01	100	8R472754	P285-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C9	27		21R410089		TCZ-27		NP0K-270			
C10	.1	100	8R472035	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C11	.1	100	8R472035	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C12	.01	400	8R9809	P485-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C13	.01	400	8R23690	P485-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C14	.5	100	8K17028	VHC36		MP2P5		RF480	68P20	
C15	.5	100	8K17028	VHC36		MP2P5		RF480	68P20	
C16	.02	1000	8K114137	P1088-02		PTE16S2		PT1612	MB-S2	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	18A510818					Volume & Sw. -Note

Note: Some Models may use alternate control (part #1K510819)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R2	470KΩ	½	6R6032	BTS-470K	
R3	150Ω	½	6R3992	BTS-150	
R4	100KΩ	½	6R6075	BTS-100K	
R5	47KΩ	½	6R6056	BTS-47K	
R6	220Ω	½	6R3933	BTS-220	
R7	6800Ω	2	6R490349	BTB-6800	
R8	1Meg	½	6R6004	BTS-1Meg	
R9	68KΩ	½	6R6074	BTS-68K	
R10	220KΩ	½	6R6015	BTS-220K	
R11	1Meg	½	6R6004	BTS-1Meg	

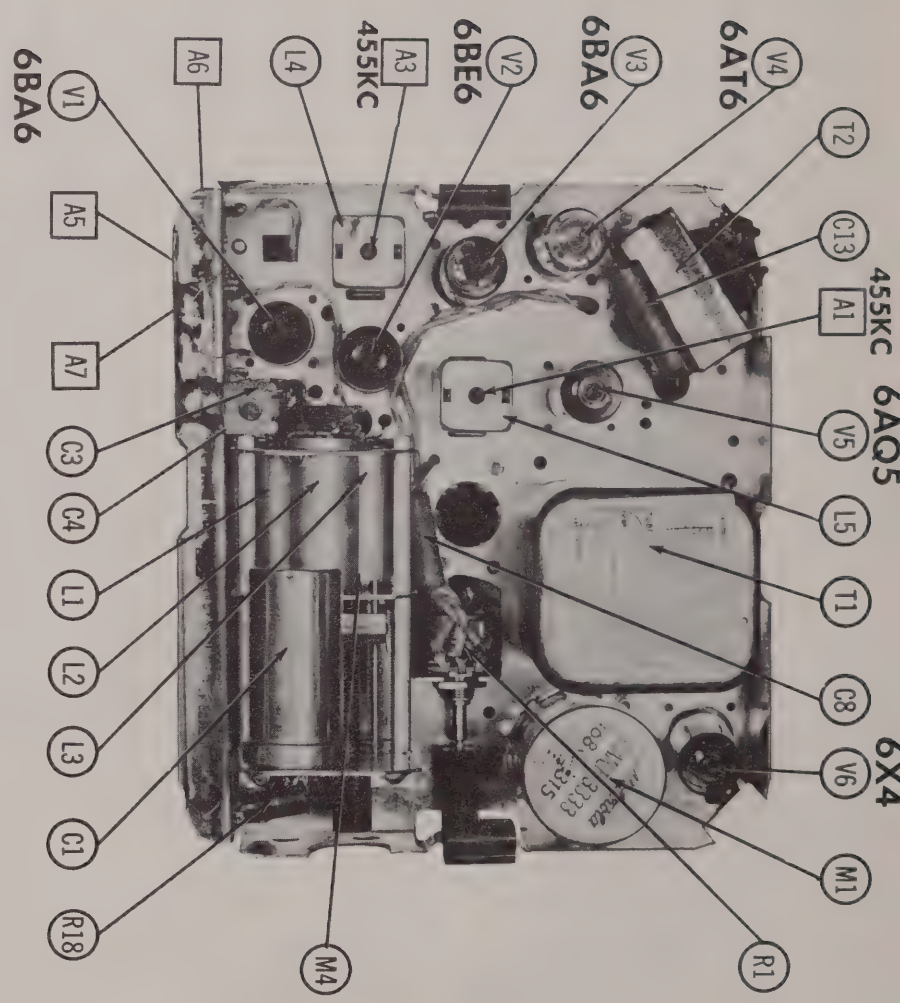
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R12	390Ω	½	6R5554	BTS-390	
R13	4700Ω	½	6R6039	BTS-4700	
R14	100KΩ	½	6R6075	BTS-100K	
R15	100KΩ	½	6R6075	BTS-100K	
R16	220Ω	1	6R6389	BTA-220	
R17	18Ω	½	6R2031	BTS-18	
R18	1000Ω	2	6R476004	BTB-1000	
R19	56Ω	½	6R5614	BTS-56	
R20	56Ω	½	6R5614	BTS-56	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC @2.9A	355VCT .042ADC			25B472533-J 25C472533 ①	P-6471			

① Alternater power transformer

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5.2KΩ	3.1Ω	484Ω	.54Ω	25B70171-N	A-3877	A-2930	RO-9	S-3X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.1Ω	50K522339 50K521882 ①	ST-803 Mod. P525-V	52A1	① Alternate 5 1/4" speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	12.5Ω		24B71881				Less core, core part #46K592080
L2	RF Coil	12.5Ω		24B71881				Less core, core part #46K592080
L3	Osc. Coil	.8Ω	3Ω	24B592153				Less core, core part #46K592080
L4	Input IF	18Ω	18Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	18Ω	18Ω	24K485555	16-6770	BC-355	12-C6	
L6	Fil. Choke	0Ω		24K78026				
L7	Choke Coil	0Ω		24K78026				
L8	Vibrator Hash Choke	.1Ω		24A472535			5221	15.2 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	48B3333	5342	859	5342	

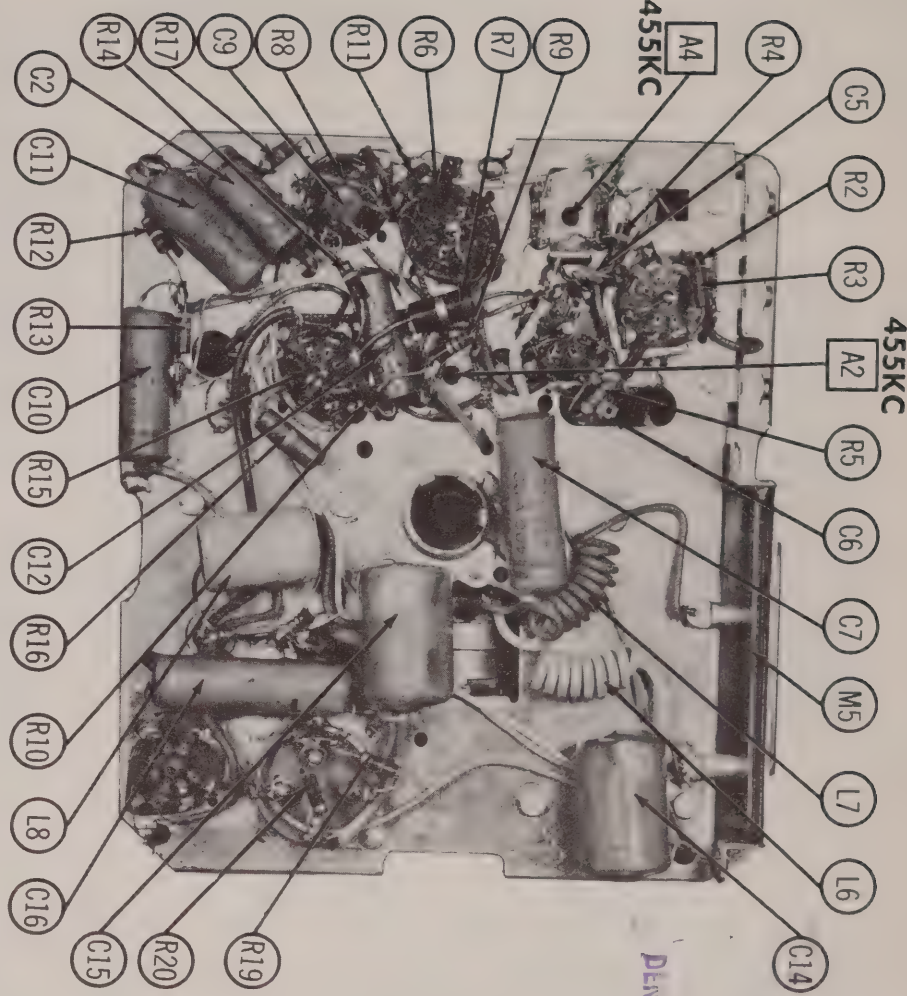
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	65K12894	9K511983 (Complete)	307014 (SFE-14A)	155014	SFE14	HDI

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X4151	Type #51
M4	RF Tuner	MT-92	Complete
M5	Spark Plate	1V592328	
A5, A6, A7	Trimmer Cap. Assy.	20K592078	Antenna, 20-180MMF, RF, 50-280MMF, Oscillator, 500-580MMF
	Housing (Front)	15D521691	(Less escutcheon)
	Housing (Rear)	1V521802	(Complete with bushing)
	Escutcheon	13D521666	

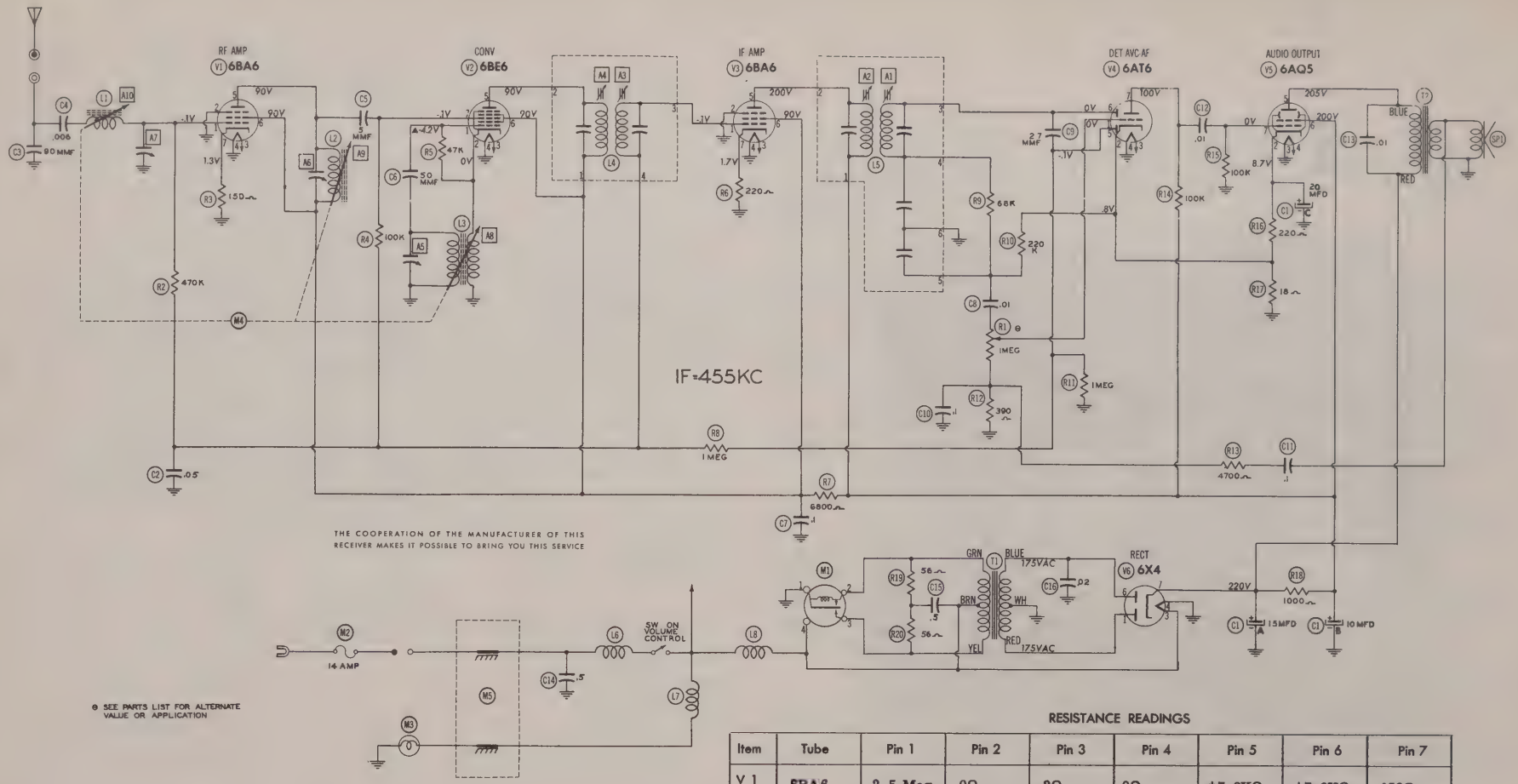
CHASSIS—BOTTOM VIEW



DENVER, COLORADO

MOTOROLA MODEL 503

MOTOROLA MODEL 503



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2. 5 Meg.	0Ω	. 2Ω	0Ω	†7. 8KΩ	†7. 8KΩ	150Ω
V 2	6BE6	47KΩ	. 8Ω	. 2Ω	0Ω	†7. 8KΩ	†7. 8KΩ	2. 1 Meg.
V 3	6BA6	2 Meg.	0Ω	. 2Ω	0Ω	†1KΩ	†7. 8KΩ	330Ω
V 4	6AT6	390Ω	18 Ω	. 2Ω	0Ω	1 Meg.	290KΩ	†100KΩ
V 5	6AQ5	100KΩ	238Ω	0Ω	. 2Ω	†485Ω	†1KΩ	100KΩ
V 6	6X4	416Ω	Inf.	. 2Ω	0Ω	Inf.	364Ω	5 Meg.

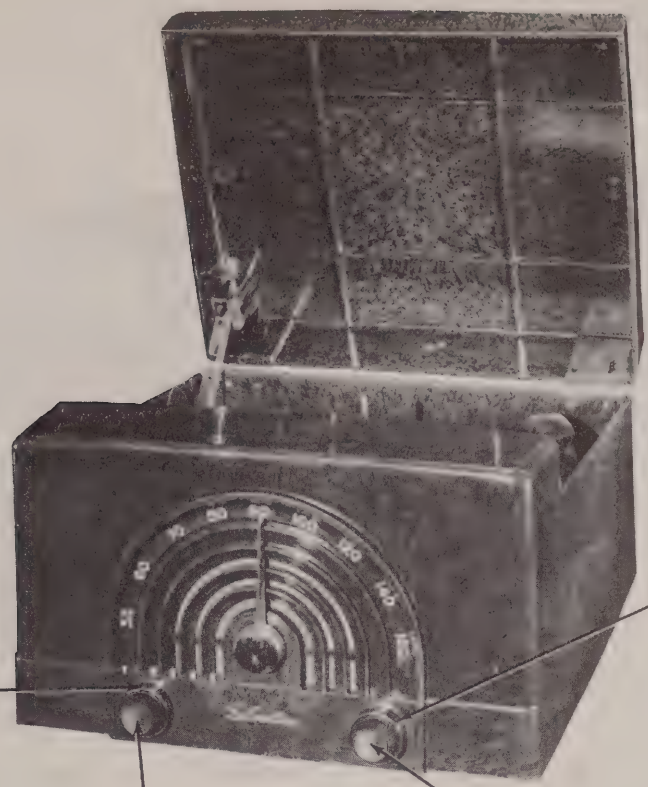
† MEASURED FROM PIN 7 OF V6.
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953

1 - DC voltage measurements are at 20, 000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6. 3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
L. F. C[illegible]SHIP
392[illegible]
[illegible]

SILVERTONE
MODEL 3040 (Ch. 528.253)



SILVERTONE
MODEL 3040 (Ch. 528.253)

TRADE NAME	Silvertone Model 3040 (Ch. 528.253)
SUPPLIER	Sears Roebuck and Co., 925 S. Homan St. Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver
TUBES (Five)	Types 12SA7 Conv., 12SK7 IF Amp., 12SQ7 Det.-AVC-AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier.

POWER SUPPLY 110 - 120 Volts AC - 60 Cycles RATING .25 Amp. @ 117Volts AC
TUNING RANGE—BROADCAST 535 - 1630 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not, connect a .1Mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1 Mfd.	High side to pin 8 (grid) of 12SA7 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. IF isolation transformer is not used, reduce dummy antenna to .001Mfd. to reduce hum modulation.
2.	"	"	1630KC	"	"	A5	Adjust for maximum output. If range of A5 is insufficient, adjust trimmer at opposite end of stator plates.
3.		Loop	1400KC	Tune for max. signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for max. output.

Replace chassis in cabinet, turn tuning gang fully closed and set pointer parallel with base of cabinet at low freq. end of dial.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 3040 (Ch. 528.253)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8R	
V2	IF Amplifier	12SK7	12SK7	8N	
V3	Det.-AVC-AF Amp.	12SQ7	12SQ7	8Q	
V4	Audio Output	50L6GT	50L6GT	7S	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd.-for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	T13-304	PRS150/50-30		EDL5315		2N520	TVA-2450	
B	30	150								
C2	.05	200	T16-197	P488-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	47		T15-229	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C4	.02	400	T16-156	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C5	.05	400	T16-189	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C6	.005	600	T16-190	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C7A	220		T17-104	SI220	D6-221		GP2K-221	UC-5322	34C3	
B	220			SI220	D6-221		GP2K-221	UC-5322		
C	.002			BPD-002	D6-202	TM5D2	GP2-333-202	DC-522		
D	.005			BPD-005	D6-502	TM5D5	GP2-333-502	DC-525		
C8	.005	600	T16-180	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C9	.05	400	T16-189	P488-05		PTE4S5		PT415	4TM-S5	
C10	.05	400	T16-189	689ZX-05		PJ4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	A24-194	QJ-347R *			UF55L	Tone - Panel
B	1Meg						UR16A	Volume-Rear
C	Switch						US-26	Attach to R1B

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-133 & P1-102 (Panel) B13-137 & R2-127 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	22KΩ	½	T60-659	BTS-22K	
R3	2.2Meg	½	T60-726	BTS-2.2Meg	
R4	47KΩ	½	T60-730	BTS-47K	
R5	470KΩ	½	T60-731	BTS-470K	
R6	10Meg	½	T60-728	BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R7	220KΩ	½	T60-667	BTS-220K	
R8	470KΩ	½	T60-731	BTS-470K	
R9	180Ω	½	T60-774	BTS-180	
R10	1000Ω	1	T60-732	BTA-1000	
R11	27Ω	½	T60-690		

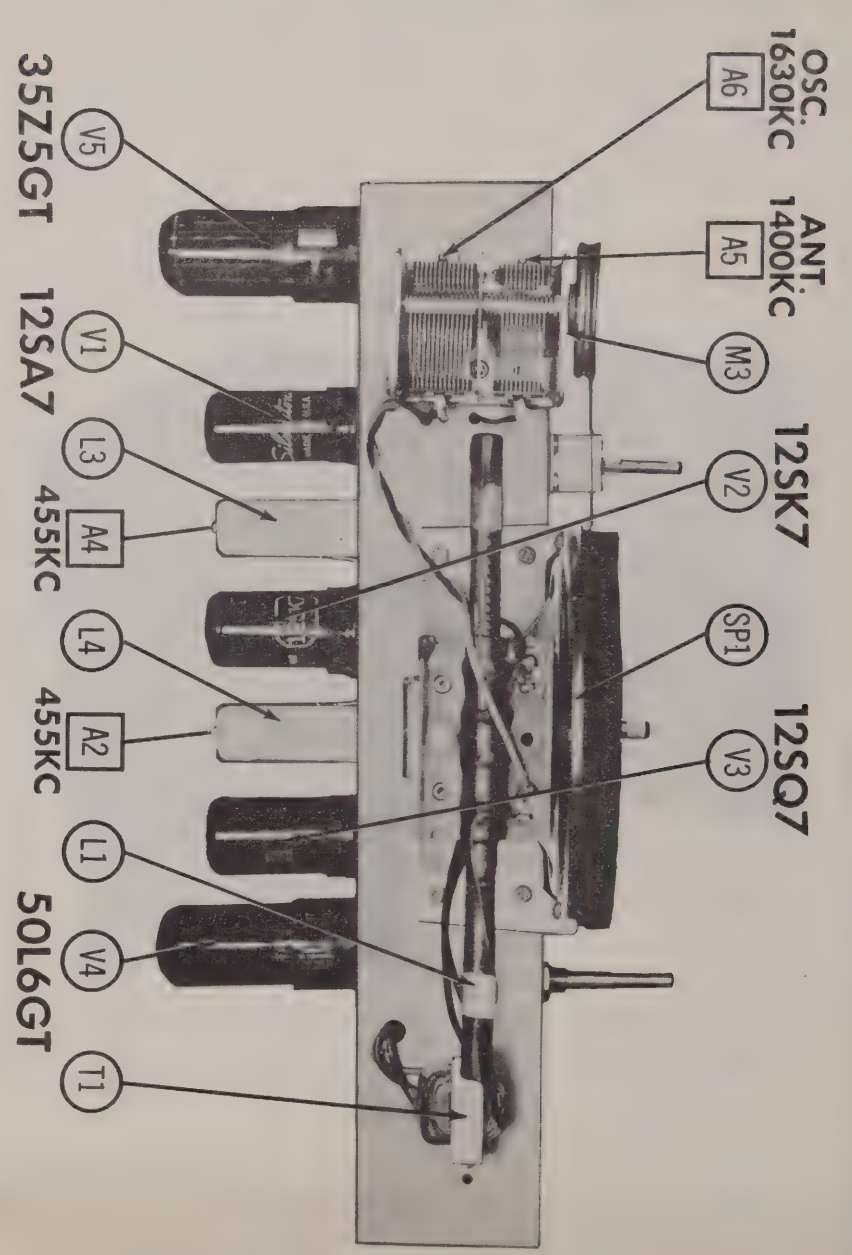
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.6KΩ	3.4Ω	228Ω tap @ 8Ω	.64Ω	80-283 80-268 ①	A-3330	A-3031	RO-3		① Alternate audio output

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.4Ω	79-412	ST-105 Mod. P5-X	5A1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	.5Ω		T82-72				
L2	Osc. Coil	1.5Ω	7.5Ω	T10-572	14-1074		70-Osc. *	
L3	Input IF	20Ω	20Ω	T10-508	16-6758	BC-352	12-C1	
L4	Output IF	23Ω	23Ω	T10-479	16-6758	BC-353	12-C2	

* Disregard tap on secondary winding.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	K3797	GC-AG-J	G-AG	WC36B	A56U	43	0-2 or S-2	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

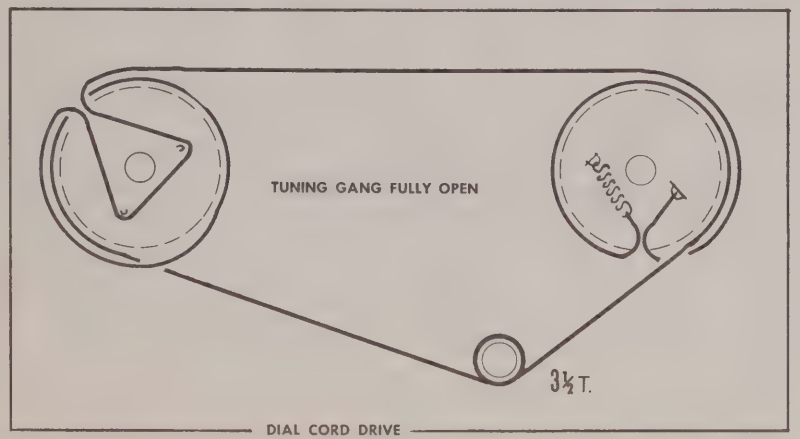
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

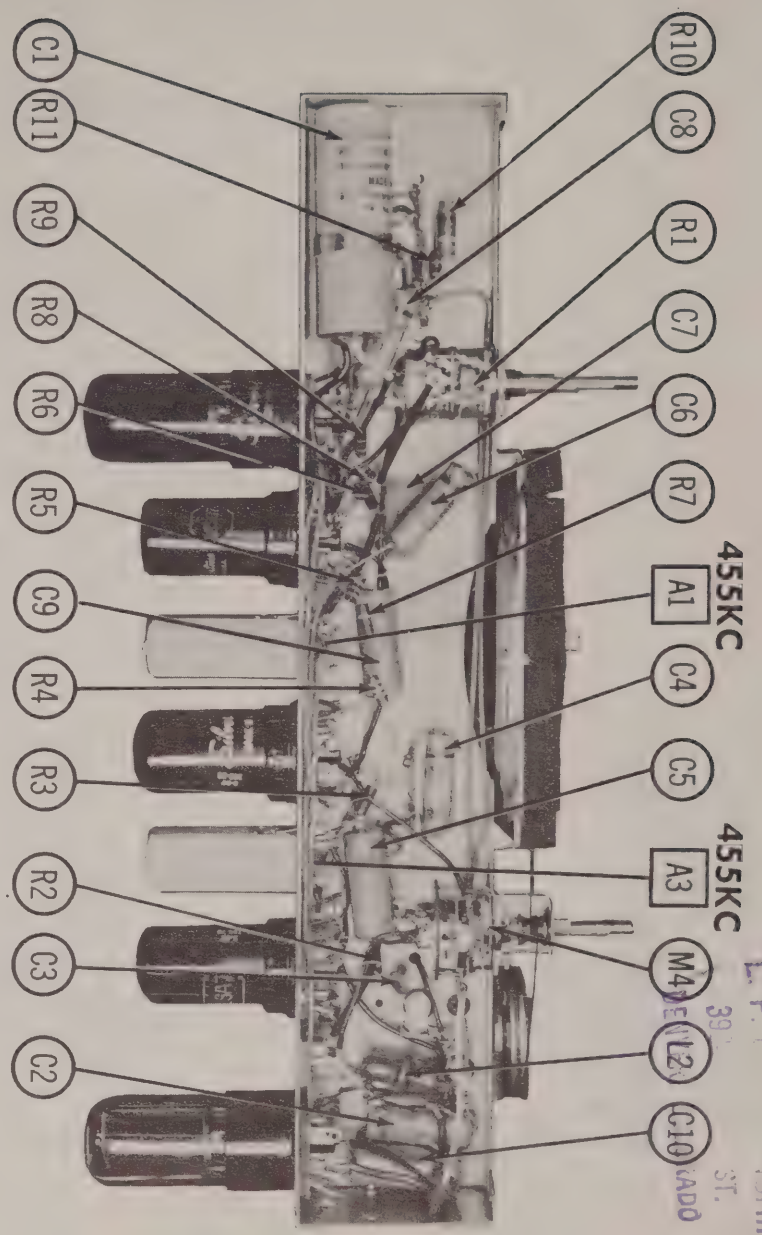
ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
M2		W-3AGA or W-3AGS	S-642 or S-652	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap.	T19-212	19-469MMF, 29-205MMF
M4	Switch	T69-188	Radio-Phono Selector
	Cabinet	T42-559	
	Back	T42-560	
	Pointer	T58-83	
	Knob	T52-410	Tone, Tuning (2 Used)
	Knob	T52-321	Off/On/Volume, Radio-Phono Selector (2 Used)



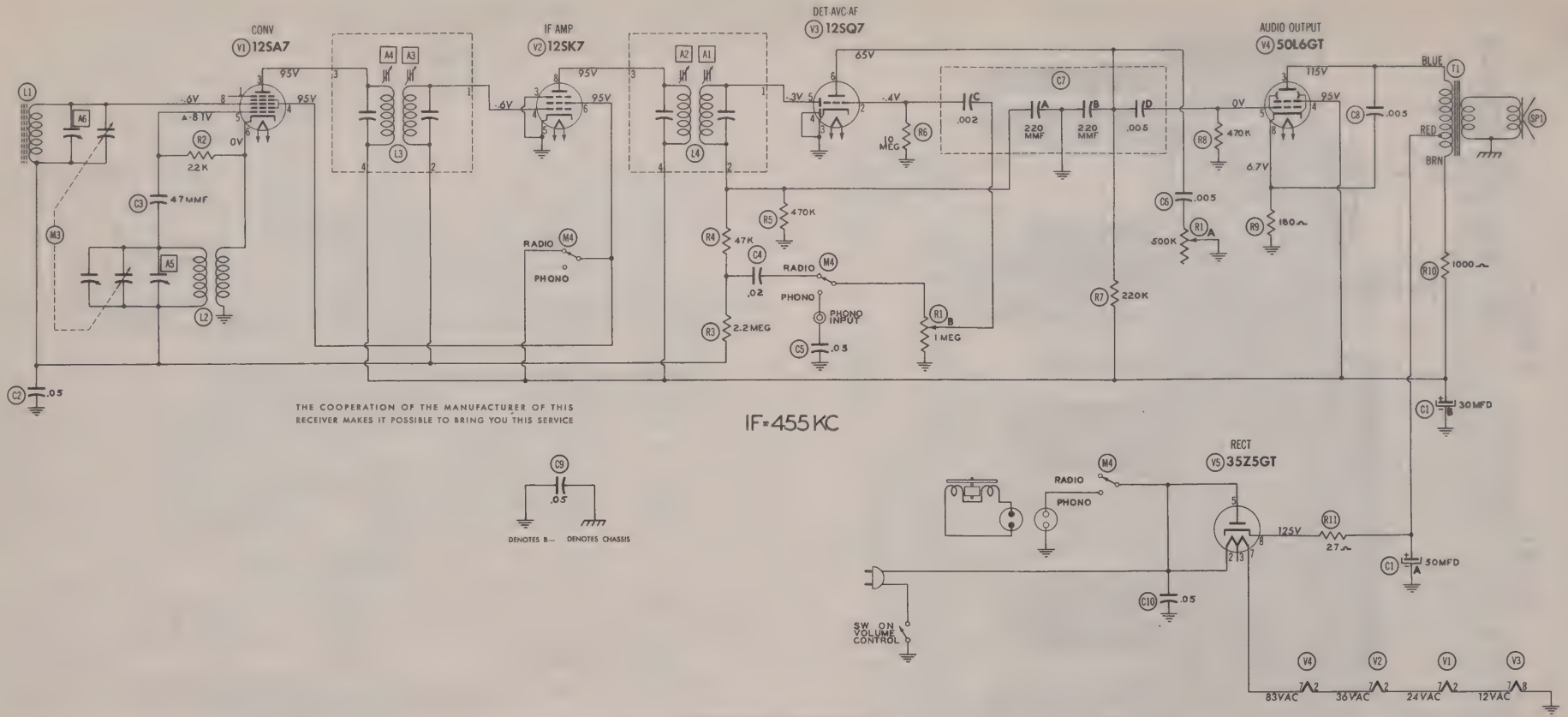
CHASSIS—BOTTOM VIEW



PROPERTY OF
E.F. [illegible] SHIP
39 ST.
ADD

SILVERTONE
MODEL 3040 (Ch. 528.253)

SILVERTONE
MODEL 3040 (Ch. 528.253)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	Inf.	12Ω	†1KΩ	†1KΩ ■† Inf.	22KΩ	1. 5Ω	24Ω	2. 7 Meg.
V 2	12SK7	Inf.	24Ω	0Ω	2. 7 Meg.	0Ω	†1KΩ ■† Inf.	36Ω	†1KΩ
V 3	12SQ7	Inf.	10 Meg.	0Ω	0Ω	470KΩ	†220KΩ	12Ω	0Ω
V 4	50L6GT	Inf.	36Ω	†247Ω	†1KΩ	470KΩ	0Ω	85Ω	180Ω
V 5	35Z5GT	Inf.	120Ω	112Ω	Inf.	120Ω	Inf.	85Ω	300KΩ

ALL MEASUREMENTS TAKEN IN "RADIO" POSITION UNLESS OTHERWISE SPECIFIED.
■ MEASURED IN "PHONO" POSITION.
† MEASURED FROM PIN 8 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953

221-9

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
L. F. PL...
38...
DEN...

SYLVANIA MODELS 513 SERIES
(Ch. 1-601-2), 563B (Ch. 1-601-3)

SYLVANIA MODELS 513 SERIES
(Ch. 1-601-2), 563B (Ch. 1-601-3)

TRADE NAME	Sylvania Models 513B, CH, GR, H, M, RE, YE (Ch. 1-601-2), 563B (Ch. 1-601-3)
MANUFACTURER	Sylvania Electric Prod. Inc., Radio & Tel. Div., 254 Rano St., Buffalo 7, N.Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-128 Volts AC-DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC	1000KC (Approx)	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1650KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.		"	600KC	Tune to 600KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

SYLVANIA
MODEL 513B (Ch. 1-601-2)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150	161-2002	PRS150/40-40		EDL4415		TCD48	TVA-2445	Red Blue
B	40	150								
C2	.01	400	162-04111M	P488-01	DD-1032	PTE4S1	GP2-333-103	PT411	4TM-S1	
C3	.047	200	160-02147	P488-047		PTE4S47		PT4147	4TM-S47	
C4	100		166-0100P	S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C5A	220									
B	2000									
C	250		*190-0009	*PA-113-1	* PC-150		*1408-01		*103C4	
D										
E	5000									
C6	.022	400	162-04122	P488-022		PTE4S22		PT4122	4TM-S22	
C7	.047	400	160-04147	489ZX-047		PTE4S47		PT4147	4TM-S47	
C8	.047	400	160-04147	P488-047		PTE4S47		PT4147	4TM-S47	

* Items C5A, C5B, C5C, C5D and C5E and R6A, R6B, R6C are combined in one unit. When replacing items separately items C5C and C5D must total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	152-0023	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume -Note
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

Note: Model 563 uses control part #152-0004.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R2	22Ω	½	181-0220		
R3	22KΩ	½	181-0223	BTS-22K	
R4	100KΩ	½	181-0104	BTS-100K	
R5	2.2Meg	½	181-0225	BTS-2.2Meg	

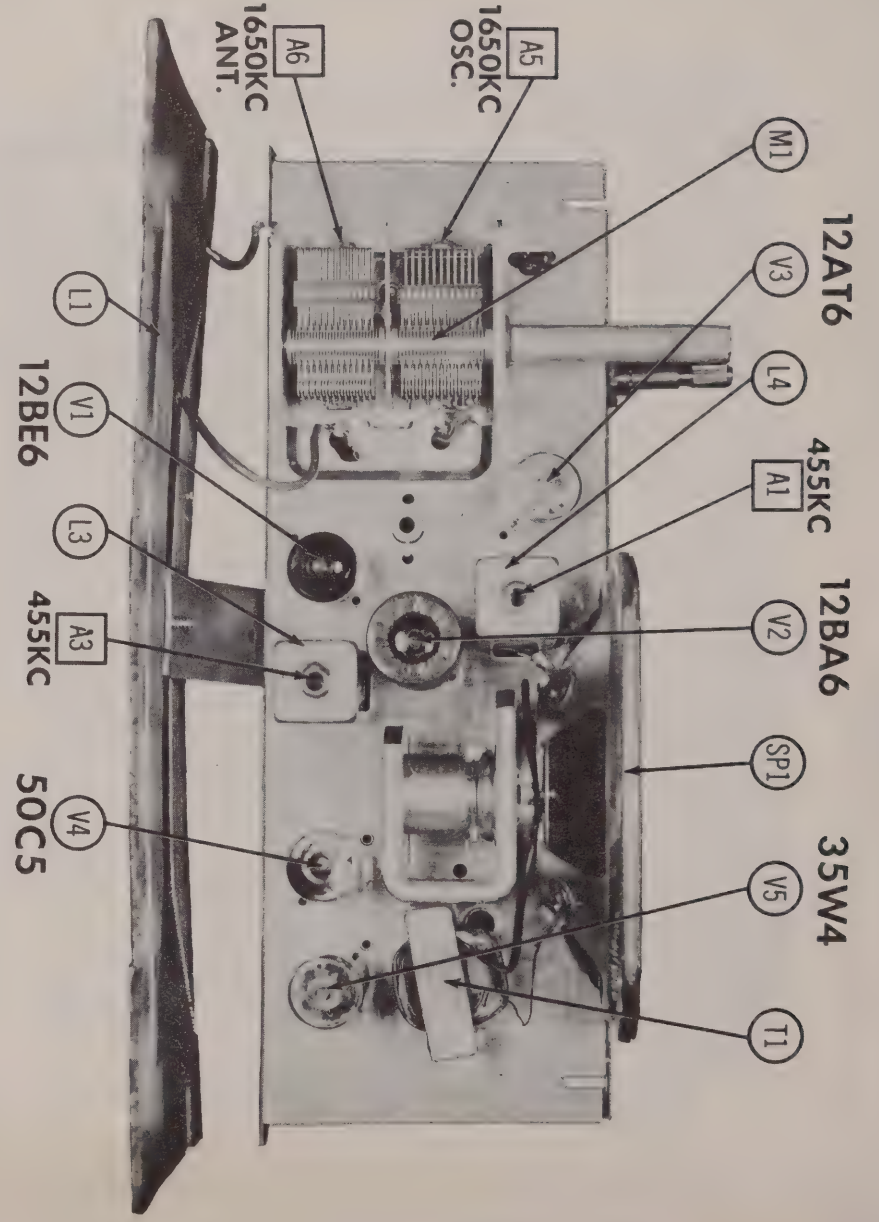
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R6A	6.8Meg	½	*190-0009	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R7	1200Ω	1	182-0122	BTA-1200	
R8	150Ω	½	181-0151	BTS-150	
R9	25Ω	1	189-0013		

* Items R6A, R6B, R6C, C5A, C5B, C5C, C5D are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.4KΩ	3.4Ω	200Ω	.55Ω	143-0011	A-3332 ①	A-3025 ①	RO-302 ①	S-1X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.4Ω		ST-105 Mod. P5-X	5A1	

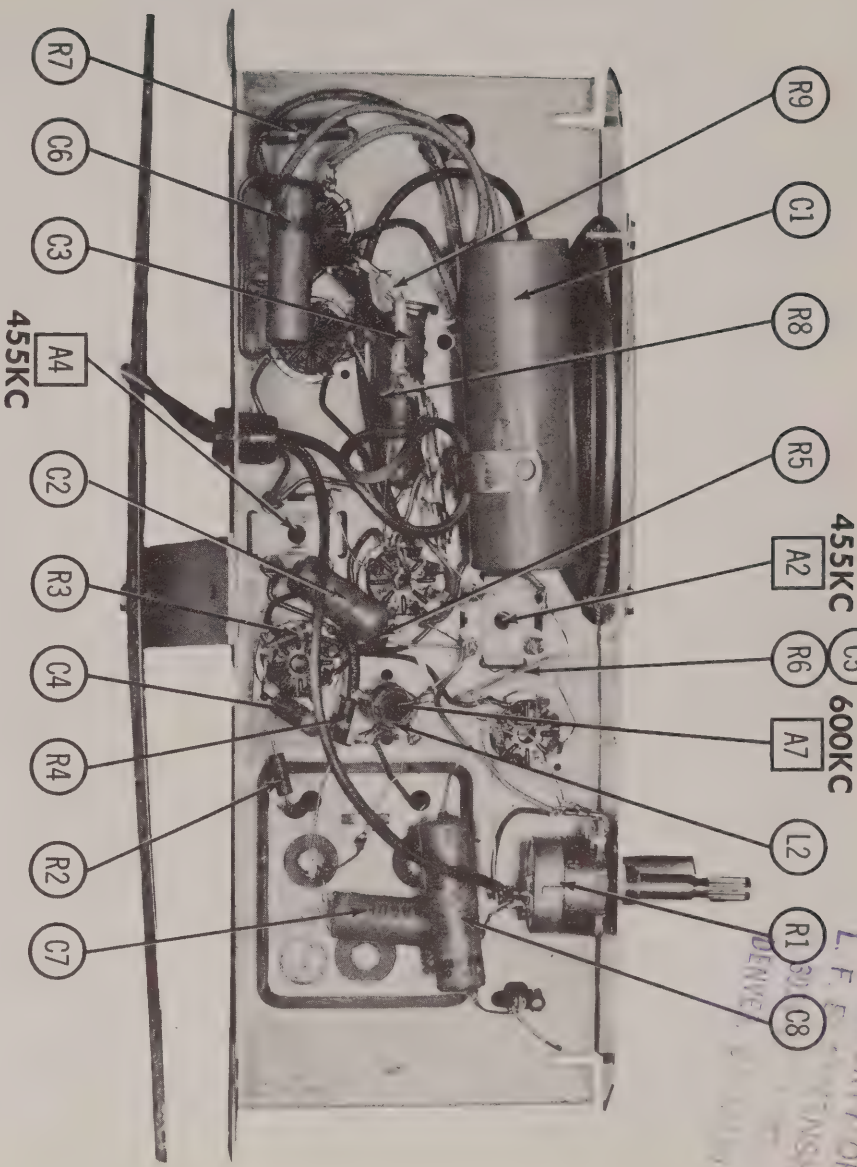
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.4Ω		582-0011				For Model 513, includes cabinet back.(Model 563B uses part #581-0002 in this application.)
L2	Osc.Coil	1Ω	8Ω	113-0026	14-1058		71-Osc.	
L3	Input IF	23Ω	21Ω	121-0013	16-6758	BC-352	12-C1	For Model 513,(Model 563B uses part #121-0016 in this application.)
L4	Output IF	16Ω	18Ω	122-0013	16-6758	BC-353	12-C2	For Model 513,(Model 563B uses part #122-0016 in this application.)

MISCELLANEOUS

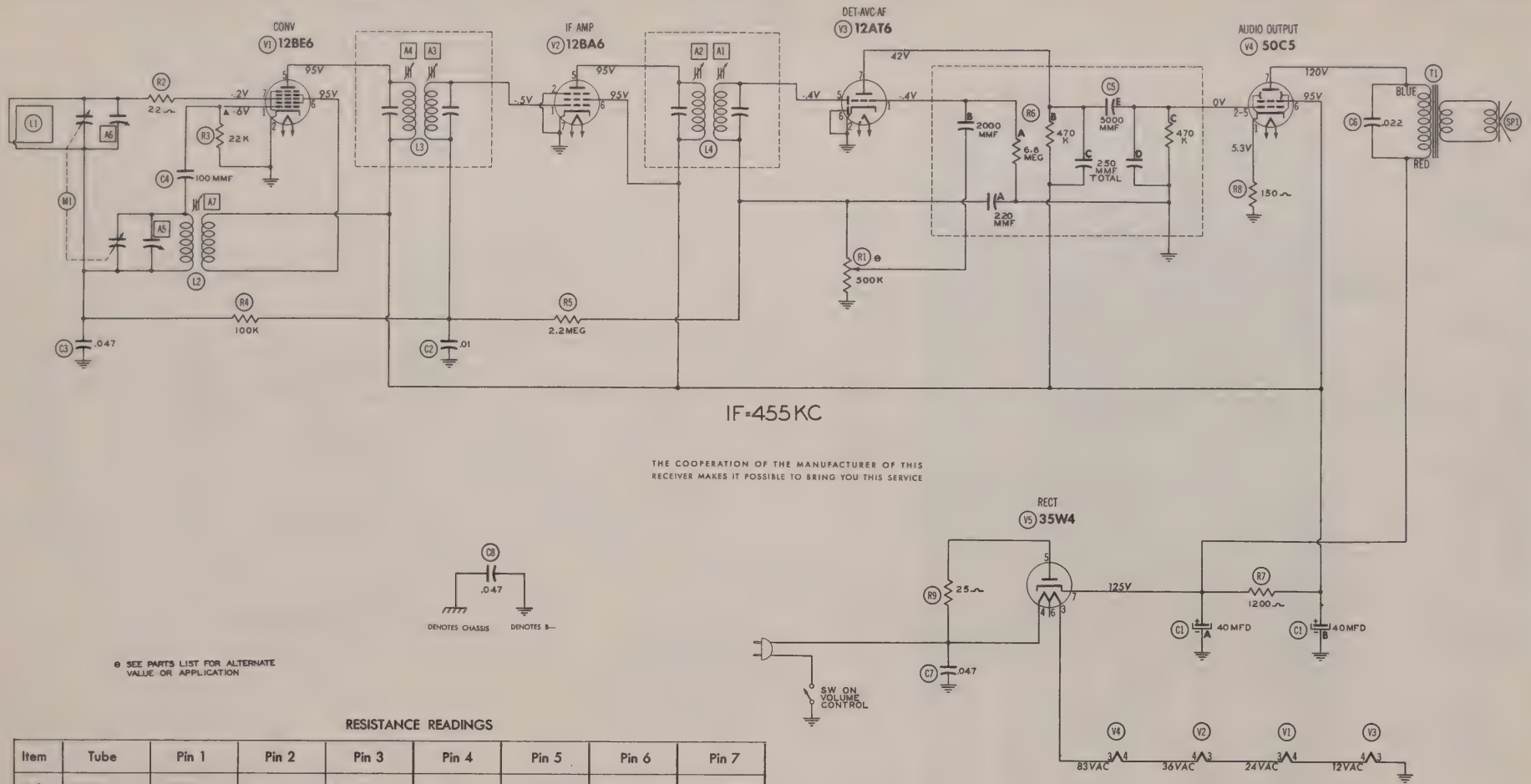
ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M1A	Tuning Cap.	170-0006	27-421MMF, 29-180MMF, Model 513 Series
B	Tuning Cap.	170-0010	Model 563B
	Cabinet	813-0007	Black, Model 513B
	Cabinet	813-0019	Chartreuse, Model 513CH
	Cabinet	813-0020	Green, Model 513GR
	Cabinet	813-0022	Ivory, Model 513H
	Cabinet	813-0009	Mahogany, Model 513M
	Cabinet	813-0025	Red, Model 513RE
	Cabinet	813-0018	Yellow, Model 513YE
	Cabinet	813-0026	Black, Model 563B
	Baffle	776-0004	
	Dial	722-0019	Model 513 Series
	Dial	722-0031	Model 563B
	Knob	740-0037	Off/On/Volume, Model 513 Series
	Knob	740-0005	Off/On/Volume, Model 563B

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. [illegible]
DENVER

SYLVANIA
MODEL 513B (Ch.1-601-2)



IF=455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	0Ω	24Ω	12Ω	†1. 2KΩ	†1. 2KΩ	2. 8 Meg.
V 2	12BA6	2. 7 Meg.	0Ω	24Ω	36Ω	†1. 2KΩ	†1. 2KΩ	0Ω
V 3	12AT6	6. 8 Meg.	0Ω	0Ω	12Ω	500KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	85Ω	36Ω	470KΩ	†1. 2KΩ	†200Ω
V 5	35W4	†1. 2KΩ	Inf.	85Ω	120Ω	145Ω	115Ω	200KΩ

† MEASURED FROM PIN 7 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1953

221-11

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

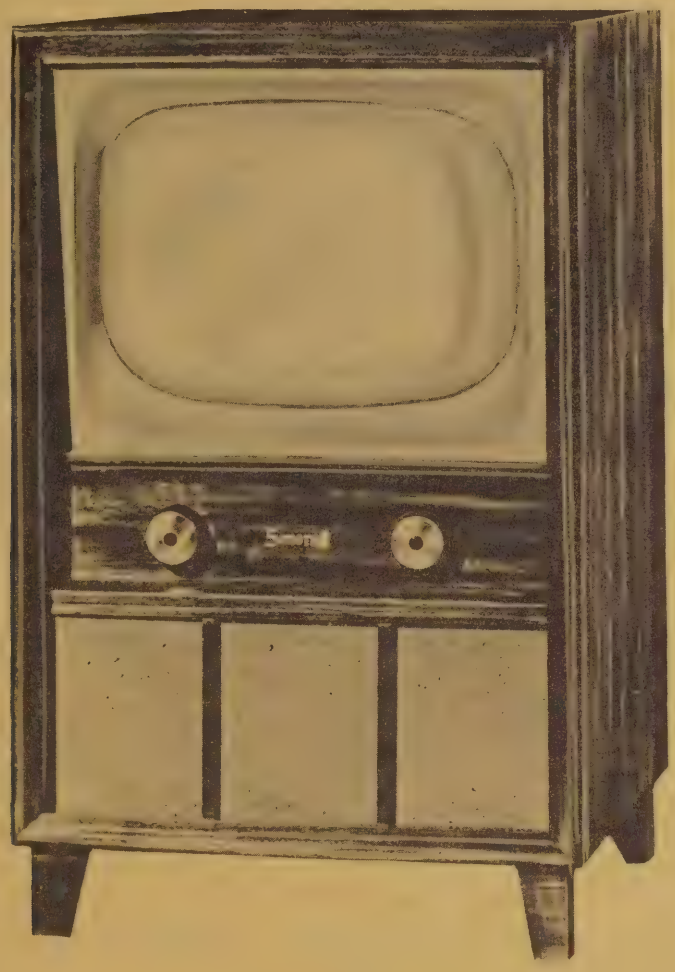
SONORA MODELS
421, 422, 423, 424, 425, 426, 428, 429

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

L. F. OF
SHIP
ST.
DENVER, COLORADO



MODEL 423

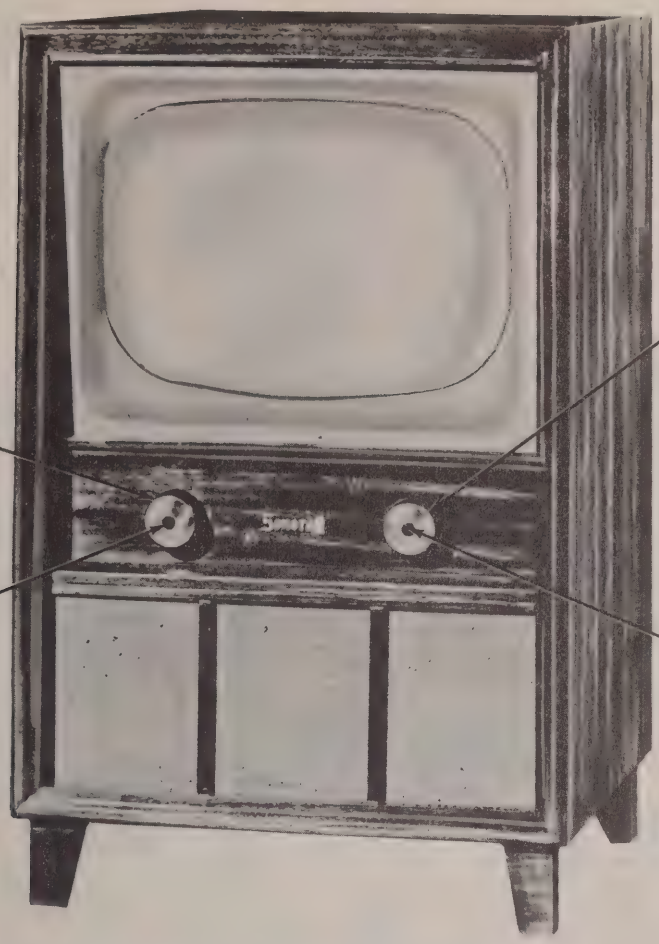
SONORA MODELS
421, 422, 423, 424, 425, 426, 428, 429

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 11-53 SET 221 FOLDER 10

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



SONORA MODEL 423

TRADE NAME	Sonora Models 421, 422, 423, 424, 425, 426, 428, 429
MANUFACTURER	Sonora Radio & Television Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE	Channels 2 thru 13, Video IF

RATING 1.46 Amp. @ 117 Volts AC

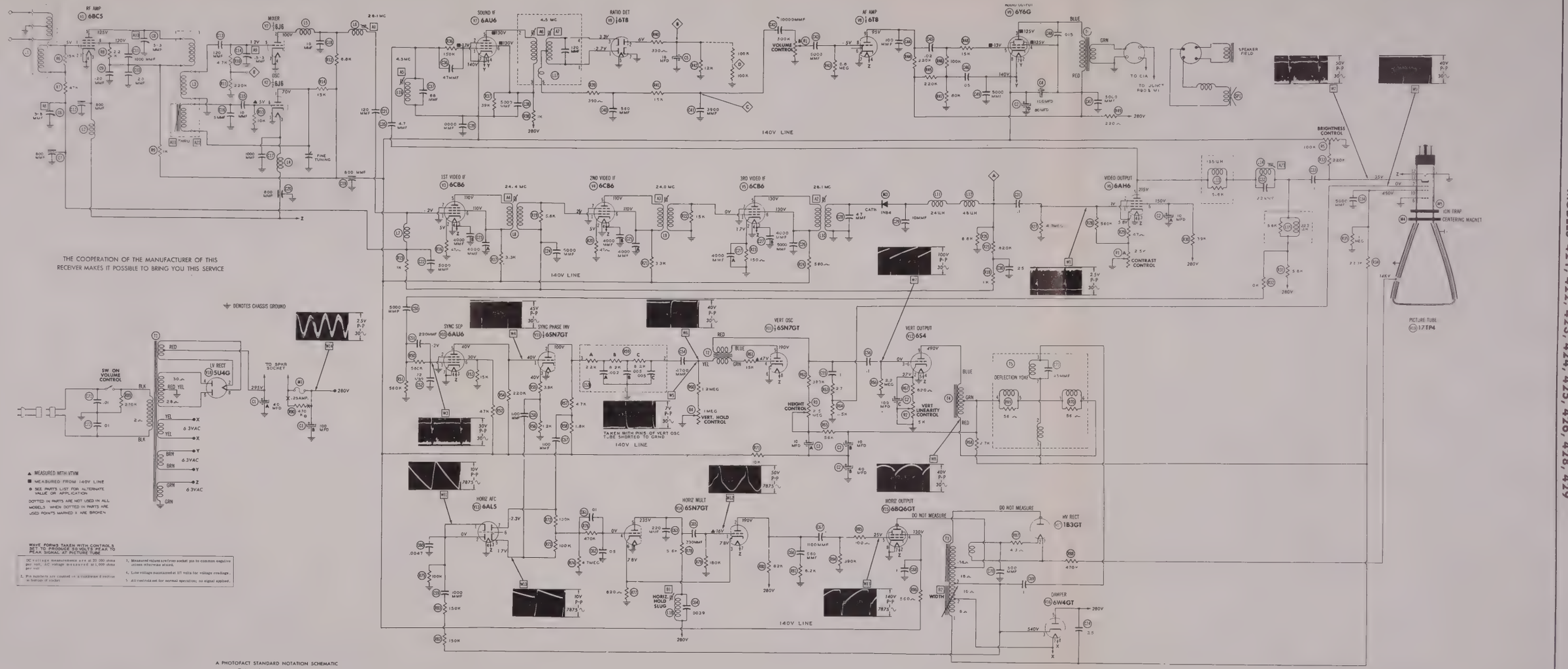
INDEX

Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 14, 15, 16
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 10
Resistor Identification 19, 20
Photographs (Cont)
Trans., Inductor & Alignment Identification 13
Resistance Measurements 8
Servicing in the Field 18
Schematic 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

SONORA MODELS
421, 422, 423, 424, 425, 426, 428, 429

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
RF AMP V1 6BC5
MIXER V2 6J6
OSC V3 6J6
SOUND IF V7 6AU6
RATIO DET V8 6T8
AF AMP V9 6T8
AUDIO OUTPUT V9 6Y6G
1ST VIDEO IF V5 6CB6
2ND VIDEO IF V6 6CB6
3RD VIDEO IF V5 6CB6
VIDEO OUTPUT V6 6AH6
SYNC SEP V10 6AU6
SYNC PHASE INV V11 6SN7GT
VERT OSC V11 6SN7GT
VERT OUTPUT V12 6S4
HORIZ AFC V13 6AL5
HORIZ MULT V14 6SN7GT
HORIZ OUTPUT V15 6BQ6GT
HV RECT V17 1B3GT
DAMPER V16 6W4GT
LV RECT V18 5U4G
PICTURE TUBE V13 17TP4
VOLUME CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
HEIGHT CONTROL
VERT LINEARITY CONTROL
VERT. HOLD CONTROL
HORIZ. HOLD SLUG
WIDTH
DEFLECTION YOKE
ION TRAP CENTERING MAGNET
SPEAKER FIELD
TO CIA
TO JUNCT PBD & W1
TO SPKR SOCKET
SW ON VOLUME CONTROL
140V LINE
DO NOT MEASURE
TAKEN WITH PINS OF VERT OSC TUBE SHORTED TO GRND
FINE TUNING
▲ MEASURED WITH VTVM
■ MEASURED FROM 140V LINE
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
1. Pin numbers are counted in a counterclockwise direction as follows (socket).
2. Measured values are from socket pin to common negative unless otherwise stated.
4. Low voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953

SONORA
MODELS 421, 422, 423, 424, 425, 426, 428, 429

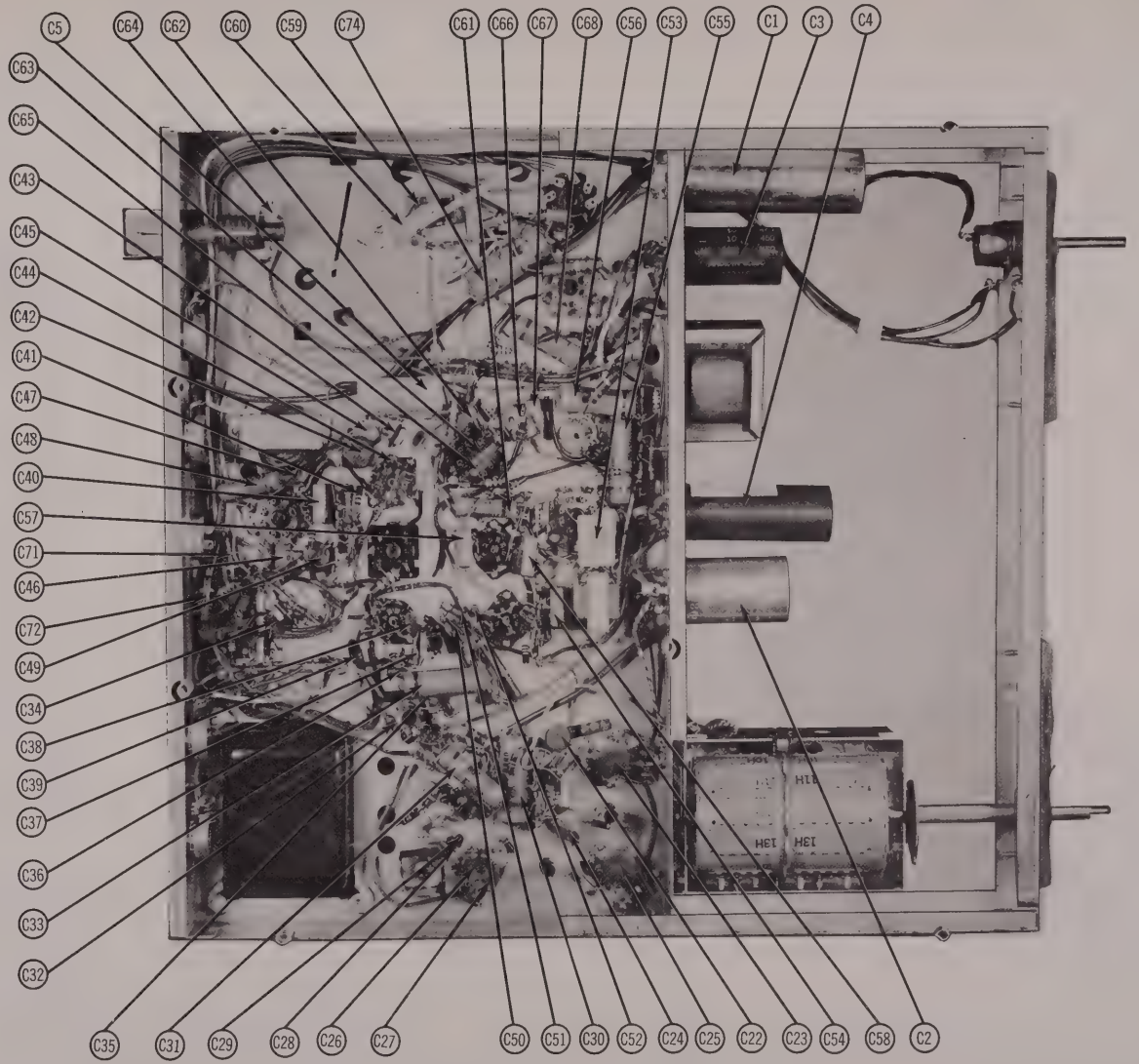
MODELS 35GSL-3064A, B, 35GSL-3083A, B

DENVER, COLORADO

CHASSIS TOP VIEW

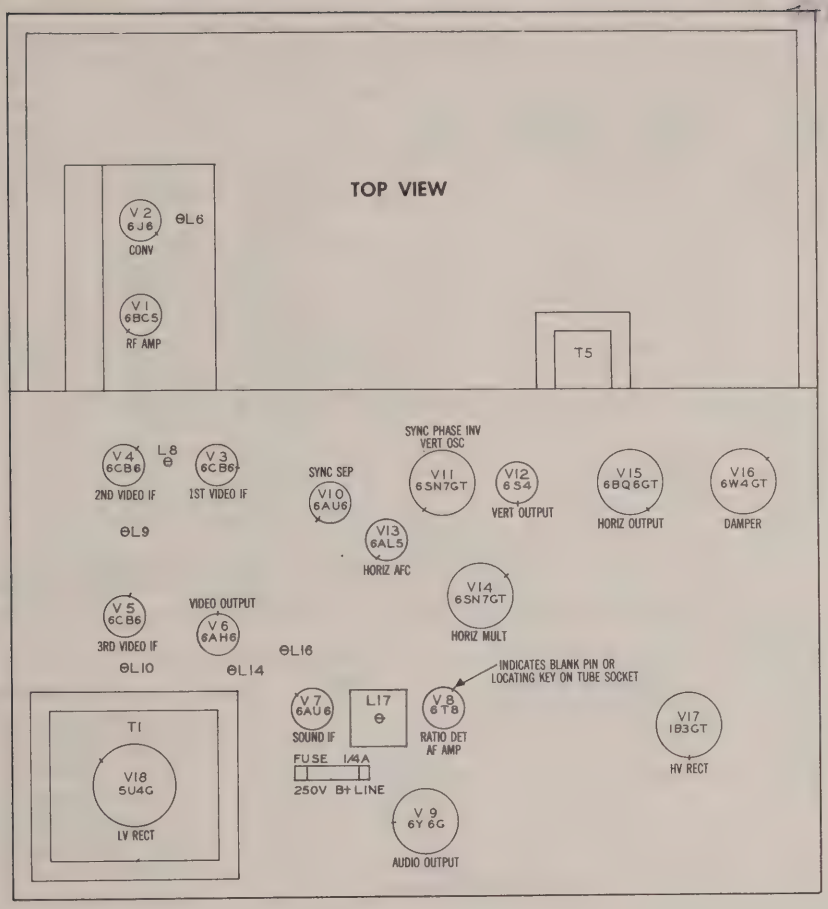
SONORA

MODELS 421, 422, 423, 424, 425, 426, 428, 429



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V18, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V 6, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V19
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V11, V12
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V10, V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V19
No vertical deflection - V11, V12
Poor vert. linearity or foldover - V11, V12
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18
Vert. off freq. - V11, V12
Horiz. off freq. - V11, V13, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative side of a 4.5 volt battery to the junction of C30 and R25. Connect the positive side to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	Not used	26.1MC	Any not used	Use VTVM. DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection. Attenuate signal generator to maintain less than 2 volt reading.
2.	"	"	"	24MC	"	"	A3	"
3.	"	"	"	24.4MC	"	"	A4	"
4.	"	"	25MC (10MC Swp)	26.1MC	"	Vert. Amp. of scope to point (A). Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 1. If necessary, retouch A1 thru A4.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point B to chassis. The junction of these two resistors is alignment point D as shown on the schematic.
Short antenna terminals to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to point A. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A5, A6	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point (C). Common to point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Short antenna terminals to chassis.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to point A. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A5, A6	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A7	Reconnect stabilizing capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

TUNER ALIGNMENT

Remove dummy converter tube and replace original 6J6 in its socket.
Ground AGC line at junction of C22 and R15.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

RF AND MIXER ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A8, A9, A10	Adjust for maximum response as in Fig. 4. If markers fall below 70% on any channel retouch A8, A9, A10 and recheck all channels.
8.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

L. F [illegible] ISHIP
3924 [illegible] ST.
DENVER, [illegible]

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove AGC ground at junction of C22 and R15.
Connect the negative side of a 4.5 volt battery to the junction of C30 and R25. Connect the positive side to chassis.
Set the fine tuning control to the mid-position of its range.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A11	Adjust to place sound marker as in Fig.5. Video marker should be at 50%.
10.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A12	"
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning until sound bars just appear in the picture.
Starting from extreme counter clockwise position adjust A23 in a clockwise direction for minimum sound indication in picture.

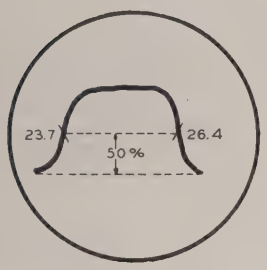


FIG. 1

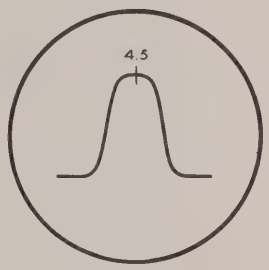


FIG. 2

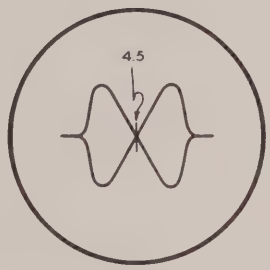


FIG. 3

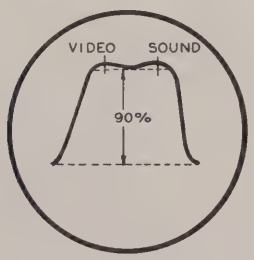


FIG. 4

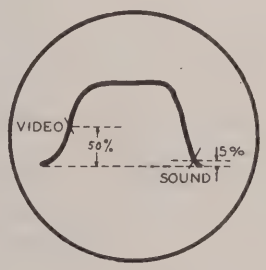
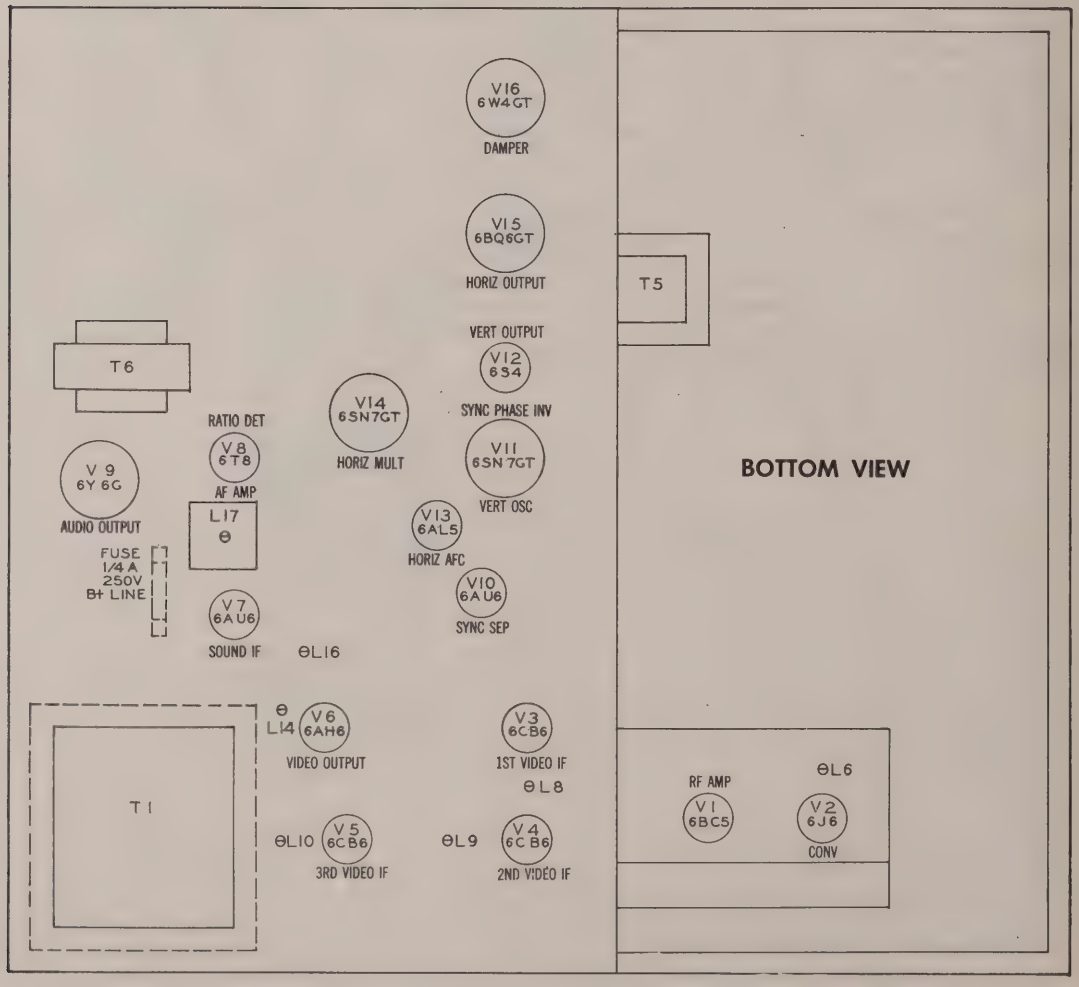


FIG. 5

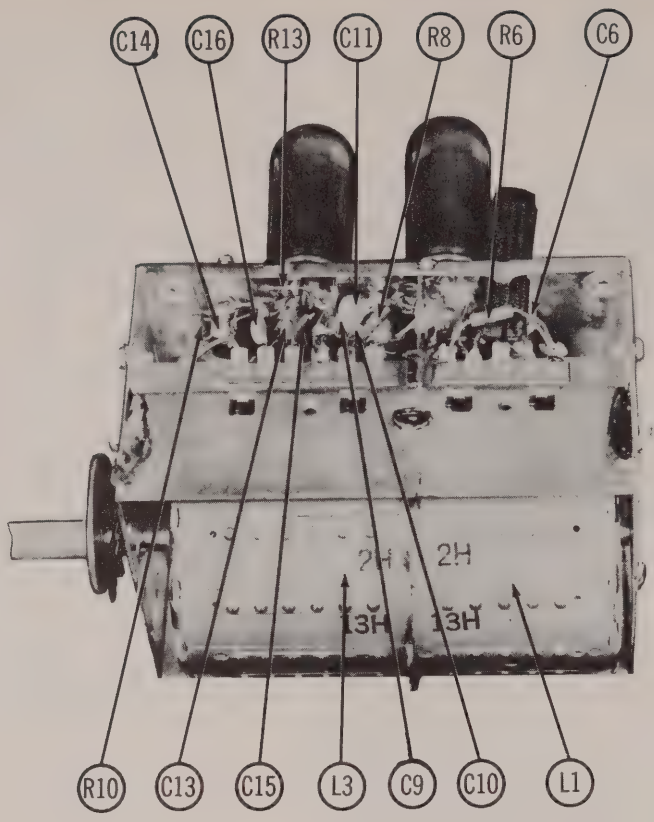
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	875KΩ	0Ω	.1Ω	0Ω	‡ 1KΩ	‡ 3. 2KΩ	0Ω		
V 2	6J6	‡ 15KΩ	‡ 6. 8KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	825KΩ	47Ω	.1Ω	0Ω	‡ 3. 3KΩ	‡ 3. 3KΩ	0Ω		
V 4	6CB6	825KΩ	47Ω	.1Ω	0Ω	‡ 3. 3KΩ	‡ 3. 3KΩ	0Ω		
V 5	6CB6	.3Ω	150Ω	.1Ω	0Ω	‡ 560Ω	‡ 560Ω	0Ω		
V 6	6AH6	500KΩ	350Ω	.1Ω	0Ω	† 5. 7KΩ	† 39KΩ	350Ω		
V 7	6AU6	‡ 150KΩ	‡ 0Ω	‡ 0Ω	‡ .2Ω	† 1. 1KΩ	† 1. 1KΩ	‡ 0Ω		
V 8	6T8	INF	12KΩ	INF	.1Ω	0Ω	INF	0Ω	6. 8Meg	† 220KΩ
V 9	6Y6G	INF	‡ .2Ω	†470Ω	† 300Ω	210KΩ	† 200KΩ	‡ 0Ω	30KΩ	
V 10	6AU6	1. 1 Meg	0Ω	.1Ω	0Ω	‡ 220KΩ	‡47KΩ	0Ω		
V 11	6SN7GT	‡ 220KΩ	‡ 6. 5KΩ	5. 1KΩ	1. 4 Meg	■ 1. 1Meg	0Ω	0Ω	.1Ω	
V 12	6S4	INF	3. 2KΩ	2. 2Meg	.1Ω	0Ω	2. 2 Meg	INF	INF	■ 2. 7KΩ
V 13	6AL5	100KΩ	100KΩ	.1Ω	0Ω	4. 8 Meg	INF	4. 8 Meg		
V 14	6SN7GT	180KΩ	†82KΩ	820Ω	5. 1 Meg	† 5. 7KΩ	820Ω	.1Ω	0Ω	
V 15	6BQ6GT	INF	. .1Ω	INF	‡560Ω	390KΩ	INF	0Ω	0Ω	TOP CAP ■18Ω
V 16	6W4GT	INF	INF	400KΩ	INF	†81Ω	INF	■10Ω	■10. 5Ω	
V 17	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ■174Ω
V 18	5U4G	INF	35KΩ	INF	29. 8Ω	INF	27. 6Ω	INF	35KΩ	
V 19	17TP4	0Ω	1. 5KΩ	Pin 6 0Ω	Pin 10 ■220KΩ	Pin 11 230KΩ	Pin 12 .1Ω			

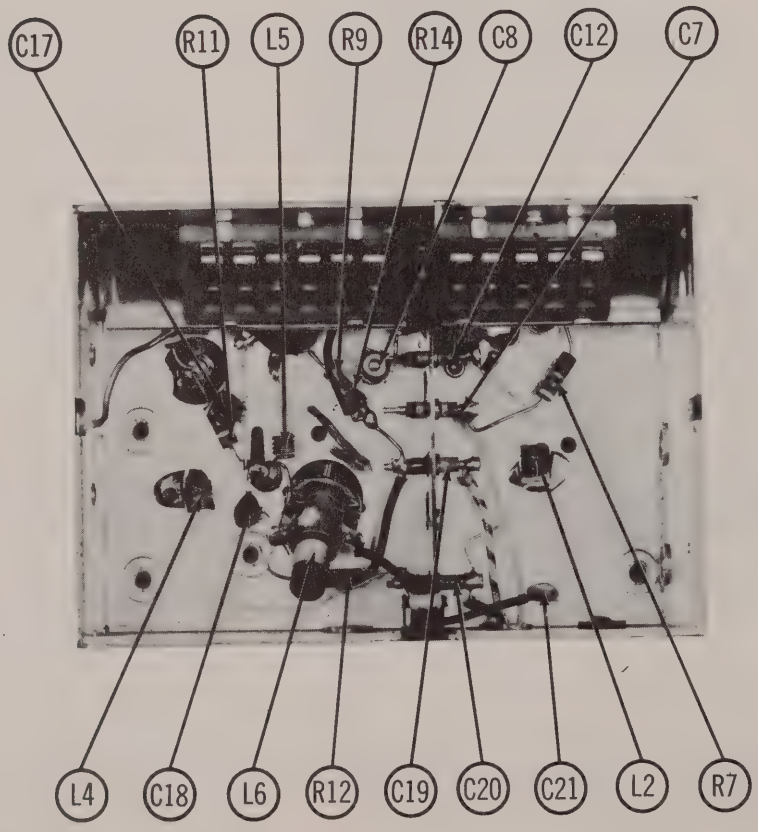
† MEASURED FROM JUNCTION OF C1A AND SPEAKER SOCKET.
‡ MEASURED FROM 140VDC LINE
■ MEASURED FROM PIN 3 OF V16.



TUBE PLACEMENT CHART

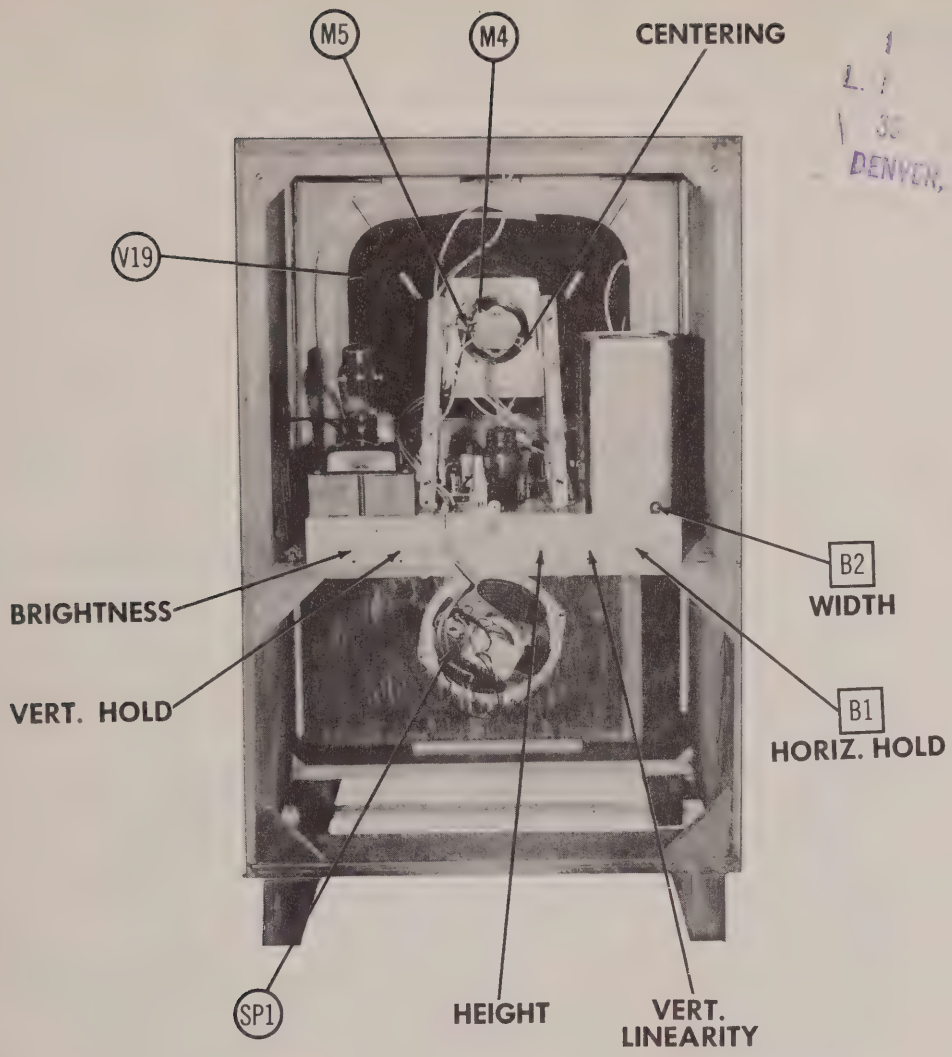


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV signal, preferably a test pattern.

Adjust the horizontal hold slug (B1) until the picture synchronizes horizontally and make any further adjustment of B1 necessary to set it to the middle of its range of synchronization.

Adjust the width slug (B2) for picture slightly wider than necessary to fill the picture mask horizontally.

Adjustment of B2 may affect the vertical size slightly.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V14, V15, V16 and V18. Check adjustment of width (B2). Check waveform at W13.

If Satisfactory	If Unsatisfactory
Check C69, C74, T3, T5A, C68 and other associated components.	Check C66, C67 and other associated circuit components.

DRIVE LINES

Check, by substitution V14, V15 and V16. Check C66, C67, C68, C69, C74, T3, T5A and other associated circuit components.

COMPRESSED LEFT SIDE

Check, by substitution, V14, V15 and V16. Check adjustment of width (B2). Check T3, T5A, C69, C74, C68 and other associated components.

FOLDS

Check by substitution V14, V15 and V16. Check T3, T5A and Boost B+ filter, C74.

XMAS TREE EFFECT

Check V14, by substitution. Check C63, C64 and C65. Check L18.

VERTICAL

LOSS OF SWEEP

Check by substitution V11 and V12. Check waveform at W7.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R67, R2 and other associated components.	Check T2, C55, C56 and other associated components.

INSUFFICIENT SWEEP

Check, by substitution, V11 and V12. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check, by substitution, V11 and V12. Check adjustment of height and vertical linearity controls. Recenter raster if necessary. Check C55, C56, C2C, T4 and other associated components.

COMPRESSED AT TOP

Check by substitution, V11 and V12. Check adjustment of height and vertical linearity controls. Recenter raster if necessary. Check T4, T5B, C2C and other associated components.

FOLDS

Check by substitution V11 and V12. Check C55, C56 and other associated circuit components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V13 and V14. Check waveform at W10.

If Satisfactory	If Unsatisfactory
Check C59, C60, R82, R83 and other associated components.	Check C58 and other components associated with V11A.

CRITICAL HOLD

Check by substitution V10, V11, V13 and V14. Proceed as outlined under "Loss of Sync".

PULLING PICTURE

Substitute V13, V14 and V15. Check AFC filter network. Check signal at W3 for signal overload, sync compression of 60 cycle modulation. Check components of stage where distortion occurs.

VERTICAL

LOSS OF SYNC

Check by substitution V10 and V11. Check C54, C53, T2, C50, C51 and other associated components.

CRITICAL HOLD

Check by substitution V10 and V11. Check components associated with V11B for change of value. Proceed as outlined under "Loss of Sync".

TRIGGERING

Check by substitution V10, V11 and V12. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Check C33, R33, R5, picture tube and other associated circuit components.

SOUND BARS

Check adjustment of local oscillator. Check 4.5MC trap adjustment (A23). Check video IF alignment.

NEGATIVE PICTURE

Check, by substitution, V6. Check vodeo detector crystal and assembly. Check components associated with video detector and output stages for change of value. Check picture tube. Check AGC network for component failure, check video IF stages for weak tubes and for component failure.

POOR CONTRAST

Substitute V6. Check video detector assembly. Check associated circuit components. Check picture tube.

SMEAR

Substitute V6. Check video detector assembly. Check C31 and C33. Check R27, R28, R30 and R31 for change of value. Check L13 and L15. Check picture tube and other associated components.

ONE WIDE BLACK BAR ACROSS PICTURE

Check tuner, video IF and video amplifier tubes for heater to cathode leakage.

P
L. F
39
DENVER, COLORADO
OF
SHIP
ST.

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

L. F ...IP
39... ...ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SONORA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	8BC5	8BC5	7BD	
V2	Converter	6J8	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6AB5	6AB5	7BK	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector-AF Amplifier	6T8	6T8	9X	
V9	Audio Output	6T8G	6T8G	9B	
V10	Sync Separator	6AU6	6AU6	7BK	
V11	Sync Phase Inv.-Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V12	Vert. Output	6S4	6S4	9AC	
V13	Horiz. AFC	6AL5	6AL5	6BT	
V14	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6BQ6GT	6BQ6GT	8AM	
V16	Damper	6W4GT	6W4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SONORA PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V19		17TP4	17TP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	⌀40	400	N-8969	AFH3-46		CO37		FP378	TVL-3792	
B	⌀100	450								
C2A	10	400	N-8967	AFH4-120		D101		FP453	TVL-4700	
B	⌀40	200								
C	⌀100	50								
D	⌀80	200								
C3A	⌀10	450	N-8039	AFH2-47		BO37		FP231	TVL-2750	
B	⌀10	450								
C4	100	200	N-8970	AFH1-36		A035	FP137 TC69	TC44	TVL-1535	
C5	16	50	N-8912	PRS150/16		BER16-907		TC44	TVA-1409	
C6	3-8		N-8395		829-10					
C7	800		N-9409	CN-1-001	MFT-1000				503C-D1	
C8	5-5		N-8396		829-3			CT585A		
C9	120		BPD-00012	D6-121	TM5T12	GP2K-121		UC-5312	5GA-T12	
C10	120			SU120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C11	1000		N-9414	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C12	800		N-9409	CN-1-001	MFT-1000				503C-D1	
C13	120		N-9411	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C14	5-5		N-8397		829-3			CT585A		
C15	10		N-9413	SU10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C16	5		N-9412							
C17	1000		N-9414	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C18	10		N-9413	SU10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C19	800		N-9409	CN-1-001	MFT-1000				503C-D1	
C20	800		N-9409	CN-1-001	MFT-1000				503C-D1	
C21	120		N-9411	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C22	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C23A	4000		N-7774	BPD-4X004	D6-402	TM5DD4	822-004	DCD-524	5HK-ZD4	
B	4000				D6-402					
C24	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C25A	4000		N-7774	BPD-4X004	D6-402	TM5DD4	822-004	DCD-524	5HK-ZD4	
B	4000				D6-402					
C26	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C27A	4000		N-7774	BPD-4X004	D6-402	TM5DD4	822-004	DCD-524	5HK-ZD4	
B	4000				D6-402					
C28	4.7		N-9047	SI4.7NP0	TCZ-4.7		NP0K-4R7	ZT-555	5TCCB-V47	
C29	10		N-9048	SU10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C30	.25	200	N-1479	P288-25		PJ2P25		PT4025	2TM-P25	
C31	.1	200	N-1351	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C32	22		N-9049	SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C33	.1	400	N-1823	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C34	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C35	4.7		N-9047	SI4.7NP0	TCZ-4.7		NP0K-4R7	ZT-555	5TCCB-V47	
C36	47		N-9050	SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C37	68		N-9051	SI68NP0	TCZ-68		NP0L-680	ZT-5468	5TCC-Q68	
C38	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C39	10000		N-9062	BPD-01	DD-103	TM5E1	811-01	DC-511	5HK-S1	
C40	560	500	N-7780							
C41	3900		N-9058							
C42	10000		N-9062	BPD-01	DD-103	TM5E1	811-01	DC-511	5HK-S1	
C43	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C44	100		N-9054	SI100	D6-101	TM5T1	GP1K-101	DC-531	5GA-T1	
C45	.01	400	N-1346	P488-02	DF-203	PTE4S3		PT415	4TM-S3	
C46	.05	300	N-1348	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C47	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C48	.015	600	N-9046	P588-015		PTE5S15		PT615	6TM-S15	
C49	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C50	5000		N-8272	BPD-008	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C51	220		N-9055	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C52	22		N-9049	SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C53A	.002			1464-002		TPTE5D2		PT625		
B	.006		N-8042	P588-005	+PC-100	PTE5D5	+1405-01	PT625	+01C1	
C	.006			P588-005		PTE5D5		PT625		
C54	4700	500	N-8693	1464-005		IDE5D5		MCB465	MS-25	
C55	.1	600	N-1823	P588-1	DF-104	PTE6P1		PT601	6TM-P1	
C56	.1	400	N-1823	P488-1	DF-104	PTE4P1		PT401	4TM-P1	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C57	100	500	N-7783							
C58	100	500	N-7783							
C59	1000	500	N-9058	1464-001		IR5D1		MCB355	MS-21	
C60	.0047	600	N-9061	P588-0047	D6-473	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C61	.01	600	N-1344	P588-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C62	.05	300	N-1345	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C63	220	500	N-9054							
C64	.0039	600	N-9060	1464-004		IDR5D4		MCB463	MS-24	
C65	330	500	N-9056							
C66	560	500	N-9057							
C67	1100	500	N-7783							
C68	.1	200	N-1351	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C69	.1	200	N-1351	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C70	500	30000	N-8041	HV30C	TV3-502	MM-C30T5	413-501	HV30035A	2DDK-T5	
C71	.01	400		489ZX-01		PT4S1		PT411	4TM-S1	Note 1
C72	.01	400		489ZX-01		PT4S1		PT411	4TM-S1	Note 1
C73	43	3000	N-9052							
C74	.25	400	N-3579	P488-25		PTE4P25		PT4025	4TM-P25	

Note 1. Some Models combine C72 and C71 in one unit.
* Items C52A, C53B, C53C, R58A, R59B, R59C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SONORA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2500Ω	½	N-8942				WF-252	Contrast-Panel
B	500KΩ	½					UR-55A	Volume-Rear
C	Switch						UB-26	Attach to R1B
R2A	5000Ω	½	N-8945	Q11-114	AG-19-8	AB-10	BU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	2.5Meg	½	N-8971	Q11-239	AG-84-3	AB-83	BU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	1Meg	½	N-8943	Q11-137	AG-61-3	AB-59	BU-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	100KΩ	½	N-8944	Q11-138	AG-49-3	AB-40	BU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SONORA PART No.	IRC PART No.	NOTES
R6	15KΩ	½	N-6424	BTS-15K	
R7	47KΩ	½	N-7134		
R8	2200Ω	½	N-5090	BTS-2200	
R9	1000Ω	½	N-4987	BTS-1000	
R10	4700Ω	½	N-5350	BTS-4700	
R11	2200Ω	½	N-4999		
R12	6800Ω 5%	½	N-4630		
R13	10KΩ	½	N-6378		
R14	15KΩ	½	N-6424	BTS-15K	
R15	1000Ω	½	N-5341	BTS-1000	
R16	47Ω	1	N-6237		
R17	3300Ω	1	N-7793	BTA-3300	
R18	1000Ω	½	N-5341	BTS-1000	
R19	5600Ω	½	N-7400		
R20	47Ω	1	N-6237		
R21	3300Ω	1	N-7793	BTA-3300	
R22	15KΩ	½	N-6424		
R23	150Ω	½	N-3683	BTS-150	
R24	560Ω	½	N-4280	BTS-560	
R25	820KΩ	½	N-4469	BTS-820K	
R26	6800Ω	½	N-4630	BTS-6800	
R27	4.7Meg	½	N-4061	BTS-4.7Meg	
R28	560KΩ	½	N-7790	BTS-560K	
R29	47Ω	1	N-6237		
R30	39KΩ	1	N-7013	BTA-39K	
R31	5600Ω	2	N-8491	BTS-5600	
R32	10KΩ	½	N-4695	BTS-10K	
R33	220KΩ	½	N-4899	BTS-220K	
R34	220KΩ	½	N-4899	BTS-220K	
R35	1Meg	½	N-2976	BTS-1Meg	
R36	150KΩ	½	N-4468	BTS-150K	
R37	39KΩ	1	N-7013		
R38	1000Ω	½	N-5341	BTS-1000	
R39	390Ω	½	N-5159	BTS-390	
R40	330Ω	½	N-4420	BTS-330	
R41	15KΩ	½	N-6424	BTS-15K	
R42	12KΩ	½	N-5690	BTS-12K	
R43	6.8Meg	½	N-4028	BTS-6.8Meg	
R44	220KΩ	½	N-4899	BTS-220K	
R45	320KΩ 5%	½	N-9041	BTS-220K 5%	
R46	100KΩ	½	N-2973	BTS-100K	
R47	180KΩ 5%	½	N-7401	BTS-180K 5%	
R48	15KΩ	½	N-6424	BTS-15K	
R49	220Ω	½	N-9040		

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SONORA PART No.	IRC PART No.	NOTES
R50	560KΩ	½	N-7790	BTS-560K	
R51	560KΩ	½	N-7790	BTS-560K	
R52	47KΩ	½	N-7134	BTS-47K	
R53	15KΩ	½	N-6424	BTS-15K	
R54	220KΩ	½	N-4899	BTS-220K	
R55	3900Ω	½	N-7399	BTS-3900	
R56	1200Ω	½	N-6793	BTS-1200	
R57	4700Ω	½	N-7000	BTS-4700	
R58	1800Ω	½	N-4281	BTS-1800	
R59A	22KΩ	½		BTS-22K	
B	8200Ω	½	*N-8942	BTS-8200	
C	8200Ω	½		BTS-8200	
R60	1.2Meg	½	N-4470	BTS-1.2Meg	
R61	15KΩ	½	N-6424	BTS-15K	
R62	390KΩ	½	N-8026	BTS-390K	
R63	2700Ω	½	N-8103	BTS-2700	
R64	1500Ω	½	N-7396	BTS-1500	
R65	56KΩ	½	N-4823	BTS-56K	
R66	2.2Meg	½	N-4420	BTS-2.2Meg	
R67	820Ω	1	N-9018	BTA-820	
R68	2700Ω	2	N-7126	BTB-2700	
R69	56Ω	½	N-8023	BTS-56	
R70	56Ω	½	N-8023	BTS-56	
R71	10KΩ	½	N-4695	BTS-10K	
R72	100KΩ	½	N-2973	BTS-100K	
R73	100KΩ	½	N-2973	BTS-100K	
R74	4.7Meg	½	N-4061	BTS-4.7Meg	
R75	100KΩ	½	N-2973	BTS-100K	
R76	470KΩ	½	N-5694	BTS-470K	
R77	820Ω	1	N-4279	BTS-820	
R78	5600Ω	1	N-7401	BTA-5600	
R79	180KΩ 5%	½	N-7401	BTS-180K 5%	
R80	82KΩ	½	N-9015	BTS-82K	
R81	8200Ω	1	N-4897	BTS-8200	
R82	150KΩ	1	N-9017	BTA-150K	
R83	150KΩ	1	N-9017	BTA-150K	
R84	390KΩ	½	N-8026	BTS-390K	
R85	100Ω	½	N-1349		
R86	560Ω	½	N-4280	BTS-560	
R87	4.3Ω	½	N-8125		
R88	470KΩ	½	N-8029		
R89	270KΩ	½	N-7004	BTS-270K	
R90	470KΩ	½	N-5694	BTS-470K	Note

Note: Not used in all Models.
* Items R58A, R59B, R59C, C53A, C53B, C53C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ①1.46A	575VCT ②.210ADC	5VAC ③2A	6.3VAC ④1.5A	N-8935					
			SEC. 4	SEC. 5						
			6.3VAC ⑤1.8A	6.3VAC ⑥3.6A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	200Ω	1400Ω	N-9002	A-8125 ①	A-3903 ①	TBO-5 ①	A-97X ①	2927T ①	Vert. Osc. Trans.
T3	183Ω tap ②80,183, ③36Ω	0Ω	N-8936			TFB-18 & TW-72 ③	D-24 & WC-12 ③④	232T1 & 212R1 ③	Horiz. Output Trans
T4	2000Ω tap ⑤,90		N-8937	A-8140 ⑤	A-3081 ⑤	TSO-6 ⑤	A-103X ⑤		Vert. Output Trans.
T5A	42Ω		N-8930	DY-10 ⑥	MDF-74 ⑥	TY-4 ⑥	Y-20 ⑥	214D1	Horiz.Deflection Coils
B	3.4Ω								Vert. Deflection Coils

① Drill one new mounting hole.
② Drill new mounting holes.
③ Connect terminal #8 to terminal #7, original terminal #3 to new terminal #7 and #8, original #2 to new #1, original #1 to new #1, connect TW-7 across terminals #3 and #1.
④ Connect original 6BQ6 plate lead to terminal #9, connect terminal #7 to terminal #7, original terminal #3 to new #5, original #2 to new #3, original #1 to new #3, connect cooled blue and green terminals of WC-12 across terminals #3 and #1 of trans.
⑤ Connect as auto transformer.
⑥ Use original deflection coil network.
⑦ Connect original 6BQ6 plate lead to terminal #10 connect terminal #2 to terminal #3, then connect original #3 to new #7, original #2 to new #5, original #1 to new #1, connect 212R1 across terminal #2 and #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	3.2KΩ	3.4Ω	168Ω	.38Ω	N-8938	A-3849 ①	A-3018 ①	RO-304	S-1X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SONORA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	8"	81Ω	3.4Ω	N-8926 N-9184 ①		8Z815	① Alternate 5" EM Speaker

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0Ω	CT 0Ω	N-9152				Channel 2
B	Ant. Coil	0Ω	CT 0Ω	N-9153				Channel 3
C	Ant. Coil	0Ω	CT 0Ω	N-9154				Channel 4
D	Ant. Coil	0Ω	CT 0Ω	N-9155				Channel 5
E	Ant. Coil	0Ω	CT 0Ω	N-9156				Channel 6
F	Ant. Coil	0Ω	CT 0Ω	N-9157				Channel 7
G	Ant. Coil	0Ω	CT 0Ω	N-9158				Channel 8
H	Ant. Coil	0Ω	CT 0Ω	N-9159				Channel 9
I	Ant. Coil	0Ω	CT 0Ω	N-9160				Channel 10
J	Ant. Coil	0Ω	CT 0Ω	N-9161				Channel 11
K	Ant. Coil	0Ω	CT 0Ω	N-9162				Channel 12
L	Ant. Coil	0Ω	CT 0Ω	N-9163				Channel 13
L2	Fil. Choke	0Ω		N-9415				
L3A	RF, Mixer Grid & Osc. Coil	0Ω		N-9164				Channel 2
B	RF, Mixer Grid & Osc. Coil	0Ω		N-9165				Channel 3
C	RF, Mixer Grid & Osc. Coil	0Ω		N-9166				Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		N-9167				Channel 5
E	RF, Mixer Grid & Osc. Coil	0Ω		N-9168				Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		N-9169				Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		N-9170				Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		N-9171				Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		N-9172				Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		N-9173				Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		N-9174				Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		N-9175				Channel 13
L4	Fil. Choke	0Ω		N-9416				
L5	RF Choke	0Ω		N-9417				
L6	1st. Video IF	.7Ω		N-9408				
L7	RF Choke	8.2Ω		N-7321			4612	10 Microhenries, (IRC part # CL-1)
L8	2nd. Video IF	.3Ω	.3Ω	N-8929	17-1063		6249	
L9	3rd. Video IF	.3Ω	.3Ω	N-8929	17-1063		6249	
L10	4th. Video IF	.3Ω	.3Ω	N-8929	17-1064		6250	
L11	Series Peaking Coil	2.7Ω		N-9350	19-3086	TY-180	6153	24 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L12	Series Peaking Coil	3.1Ω		N-8932		TV-180	4628	48 Microhenries
L13	Series Peaking Coil	6.5Ω		N-8933	19-3160 *	TV-184 *	4644 *	155 Microhenries, wound on 5.6KΩ resistor
L14	4.5MC Trap	3.9Ω		N-9011	20-1004	TV-151	1470	
L15	Shunt Peaking Coil	8Ω		N-8934		TV-185 *	4646 *	222 Microhenries, wound on 5.6KΩ resistor
L16	Sound IF	1.1Ω		N-7746	17-3400	TV-151	1469	
L17	Ratio Det.	9Ω	.6Ω CT	N-8928	17-1033 †	TV-110 †	1468 †	Tertiary winding -.4Ω
L18	Horiz. Osc.	50Ω		N-8931	19-1576	TV-163	6210	

* Parallel with 5.6KΩ resistor
† Drill mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SONORA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG (S/B)	1/4 A. 125V.	N-7355	N-9007	313.250 (3AG 1/4A S/B)	357001	MDL 1/4	4406

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M2	RF Tuner	N-8927	
M3	Crystal Diode		Video Detector (Type 1N64)
M4	Centering Magnet	N-8939	
M5	Ion Trap	N-9012	
	Knob	N-9018	Fine Tuning
	Knob	N-9260	Channel Selector
	Knob	N-9261	Off/On/Volume
	Knob	N-9020	Contrast

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
2074 MONROE ST
DENVER

AUDIO

WEAK OR NO SOUND

Check by substitution, V7, V8, and V9. Check stages of V8B and V9 using audio signal generator. Apply audio signal across R43.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V8B especially all coupling and by-pass capacitors.

BUZZ

Substitute V8. Realign ratio detector and audio IF stages. Follow outline in alignment table. Check C5, C40 and C41.

DISTORTED

Check by substitution V7, V8 and V9. Check stages of V8B and V9 using audio signal generator and scope. Apply audio signal across R43. Connect scope across secondary of T6.

If Satisfactory	If Unsatisfactory
Check audio IF and ratio detector alignment and components.	Check components associated with V8B and V9 especially C44, C45, C49, C47, C48, T6 and speaker.

POWER

DEAD SET

Check 1/4 Amp. fuse (M1). Check AC interlock assembly, T1 and switch on volume control if filaments do not light.

SMALL AND/OR DIM RASTER

Check M1. Check V18. Check B+ filter and decoupling network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V14, V15, V16 and V17. Check waveform at W13.

If Satisfactory	If Unsatisfactory
Check R87, R88, C70, T3, T5A, C69, C74 and other associated components.	Check C66, C67 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V14, V15, V16, V17 and V18. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V14, V15, V16, V17 and V18. Check R87, R88, C70, C69, C74, T3, T5A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PICTURE

See "Loss of Video".

RASTER NO SOUND NO PICTURE

Check by substitution V1, V2, V3, V4, V5 and V6. Check associated components.

NO RASTER NO SOUND NO PICTURE

See "Dead Set".

TOTAL LOSS OF SYNC

Check by substitution V10 and V11. Check associated circuit components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

POOR FOCUS

Check V18. Check potentials applied to picture tube. If satisfactory check picture tube for low emission and/or gassy condition.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

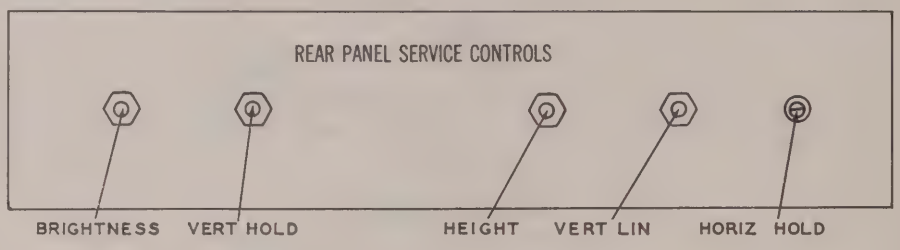
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 3 wood screws holding wood strip at top of cabinet. Remove wood strip and safety glass. Use extreme catuion when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Adjust the horizontal hold slug (L18) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L17) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

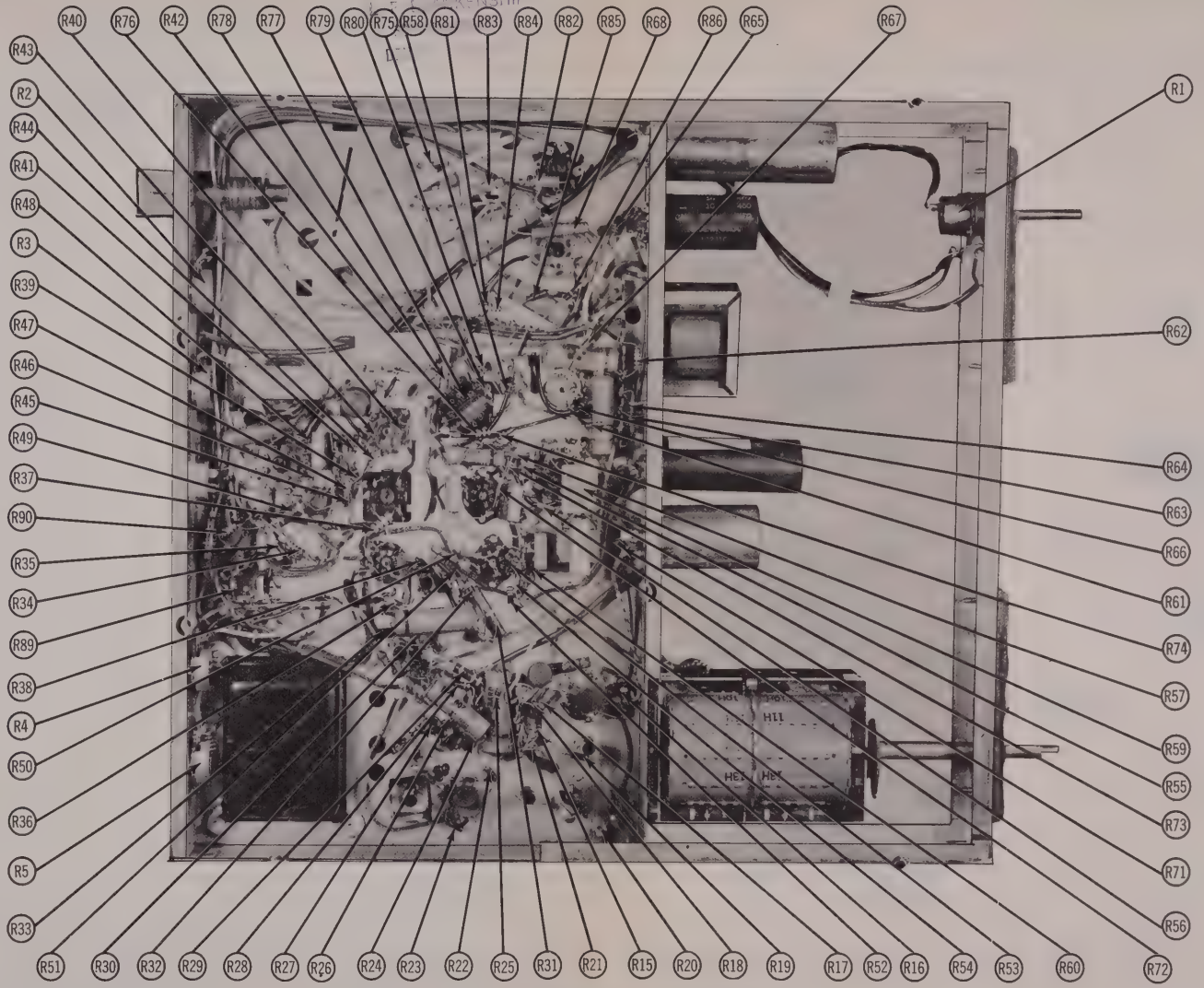
CENTERING

Centering is accomplished mechanical by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the knurled knob and at the same time rotate the ring around the tube until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Disconnect built-in antenna. Remove 2 screws. Remove antenna strip from rear cover.
3. Remove 3 wood screws, loosen 2 wood screws, remove 1 metal screw, lift rear cover up and remove.
4. Disconnect speaker.
5. Remove 5 chassis bolts. Remove chassis.
6. Remove 2 wood screws. Remove speaker.

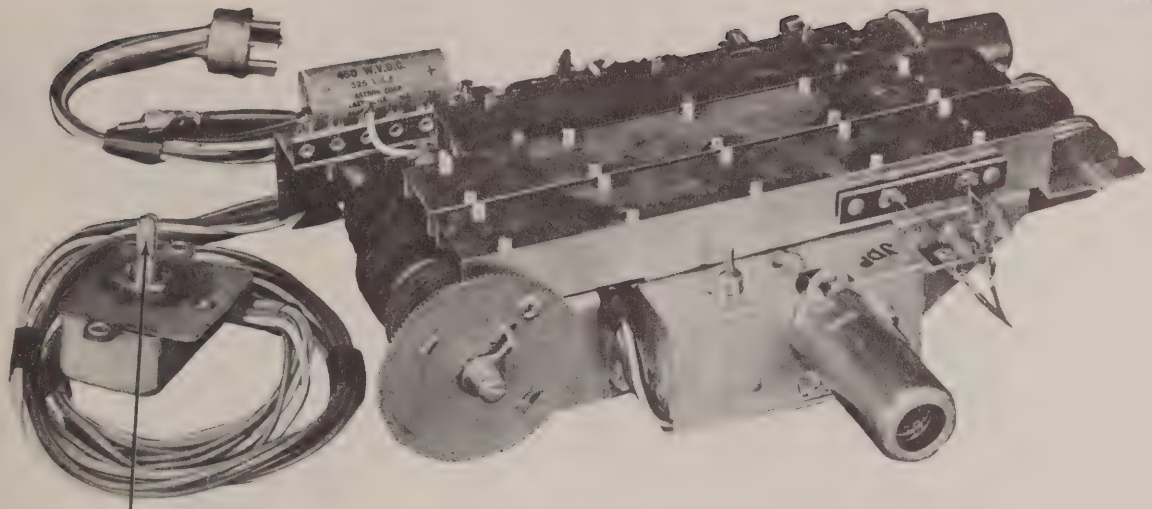
PROPERTY OF
KENSHIP



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. [illegible] SHIP
39[illegible] ST.
DENVER, COLORADO

TRUETONE
MODEL 3D6000 UHF Conv.



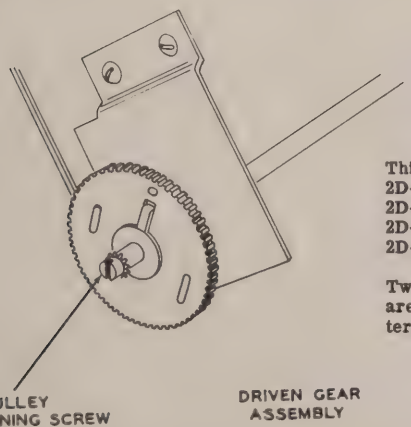
UHF-VHF SELECTOR

TRUETONE
MODEL 3D6000 UHF Conv.

TRADE NAME	Truetone Model 3D6000
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	UHF Tuner For Truetone VHF Television Receivers (See list below for models)
TUBES (Two)	Types 6AF4 Oscillator, 6BK7 IF Amp.
POWER SUPPLY	280 Volts DC & 6.3 Volts AC
TUNING RANGE	Channels 14 thru 83

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The tuner should be connected to its associated VHF receiver and operating normally.
The cascode Pre-IF amplifier can be aligned, if necessary, by connecting a 25MC unmodulated signal to the junction of L4 and L5 and a VTVM across the video IF detector load resistor.
Adjust A1 and A2 for maximum deflection on VTVM.
In the event of dial cord replacement or component replacement, the RF cavities may be adjusted for peak performance.
Tune to a UHF program, loosen the pulley positioning screw (Fig. 1) and rotate the RF drive pulleys for best picture.
Tighten the positioning screw.
Complete realignment of the UHF Tuner involves the use of precision UHF test equipment and should not be attemped in the field.



PULLEY POSITIONING SCREW

DRIVEN GEAR ASSEMBLY

FIG. 1

This UHF tuner is designed to be used in the following Truetone receivers: 2D-1091A, 2D-1095A, 2D-1191A, 2D-1195A, 2D-1224A, 2D-1225A, 2D-1228A, 2D-1315A, 2D-1325A, 2D-2043A, 2D-2047B, 2D-2049A, 2D-2052A, B, C, D, E, 2D-2149A, 2D-2152A, 2D-2215A, 2D-2219A, 2D-2223A, 2D-2312A, 2D-2314A, 2D-2321A, 2D-2322A, B

Two variations of this tuner may be encountered. However, the differences are minor. The later version may be easily identified by the addition of a terminal board below resistor R3

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TRUETONE
MODEL 3D6000

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	RF Oscillator	6AF4	6AF4	7DK	
V2	IF Amplifier	6BK7	6BK7	9AJ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	8	450	8C-13453	PRS450/8		BR845A		TC71	TVA-1704	
C2	1000		8G-20878	CN-1-001	MFT-1000					
C3A	1000		8G-19506	BPD-2X001	DD-2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C4A	1000		8G-19506	BPD-2X001	DD-2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C5	47		8G-20740	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C6	1000		8G-13201	S11000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C7	1000		8G-13201	S11000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C8	1000		8G-13201	S11000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C9	22			S122N750	TCN-22		N750K-220		5TCU-Q22	Note 1
C10	20		8G-21315							
C11	100			S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	Note 1
C12	100			S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	Note 1

Note 1 Not used on all units.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R1	680KΩ	1/2		BTS-680 K	Note
R2	4700Ω	1/2	9B1-70	BTS-4700	
R3	22Ω	1/2			Note
R4	160Ω-5%	1/2	9B1-140	BTS-160-5%	
R5	12KΩ	3	9C11-1112		

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R6	10KΩ	1/2	9B1-74	BTS-10K	
R7	3900Ω	1/2	9B1-69	BTS-3900	
R8	1500Ω	1/2	9B1-64	BTS-1500	
R9	27KΩ	1/2	9B1-79	BTS-27K	
R10	22Ω	1/2			

Note : Not used in all models.

COILS (RF-IF)

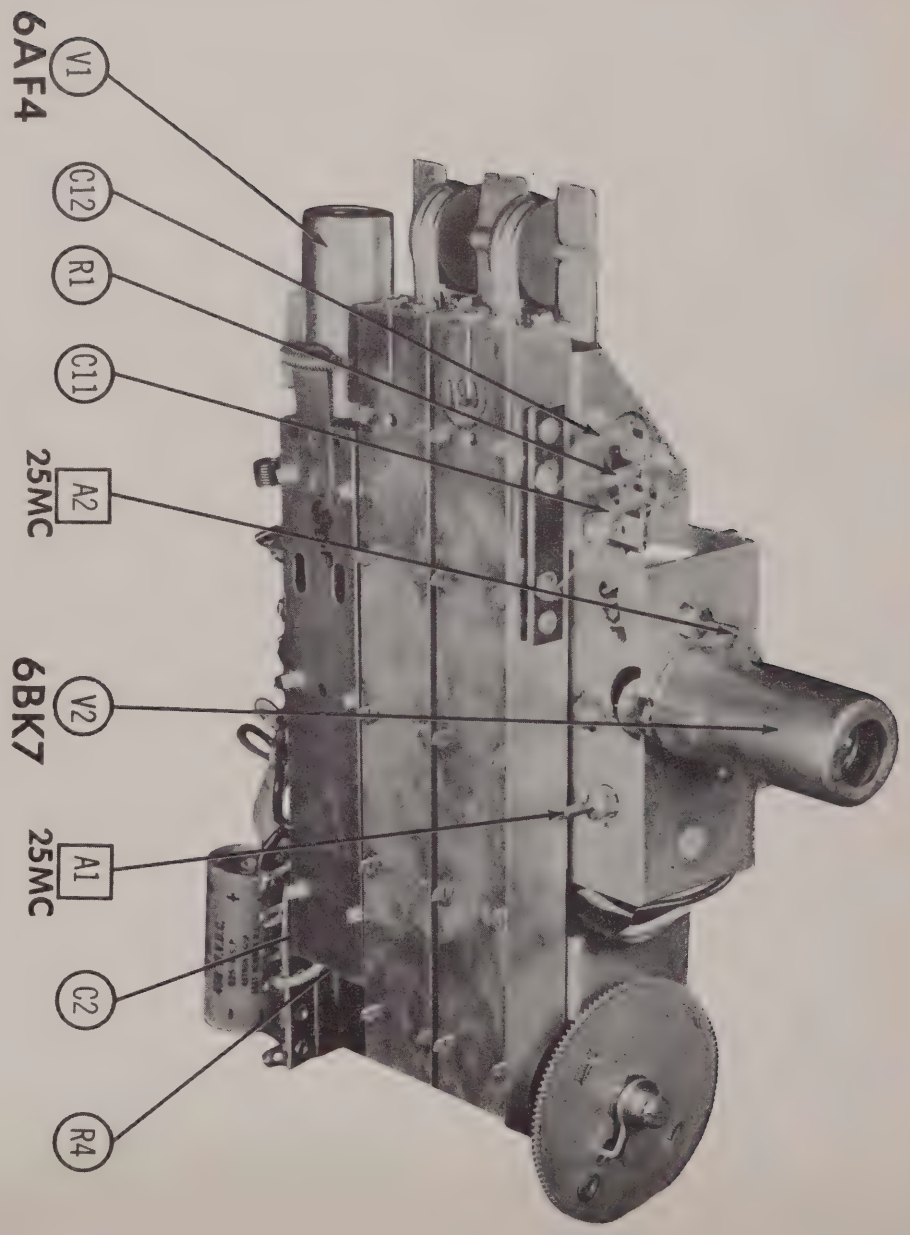
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	TRUETONE PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Fil. Choke	0Ω		16A-20469			
L2	Cathode Choke	0Ω		16A-20470			
L3	IF Coupling	.8Ω		16A-20537			
L4	IF Input Coil	.6Ω					Note 1
L5	RF Choke	2.6Ω					Note 2
L6	IF Output Coil	.8Ω		201-20483			

Note 1. Some Models use tapped IF Input coil, part #201-20482.
Note 2. Not used in all models.

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Crystal Diode	8M-21655	Converter (CK-710)
M2	Switch	20F-12108	UHF-VHF Selector
	RF Dial Cord	200-21772	With Ribbon (4 11/16")
	RF Dial Cord	200-21357	With Lug (5")
	Osc. Dial Cord	200-21309	With Lug & Spring (10 9/16")
	Osc. Dial Cord	200-21310	With Lug & Spring (7 7/8")

CHASSIS—TOP VIEW



SERVICING HINTS

To determine whether the oscillator section is functioning , a convenient check point has been provided where the oscillator current can be measured. To measure the oscillator grid current, remove the jumper wire (refer to photos) and place a suitable milliammeter on the 10 milliampere scale in its place. A reading of 1 to 3 milliamperes should be obtained, if the oscillator is functioning normally. Later units may incorporate a 22Ω resistor in place of the jumper. In these units connect the ammeter on the 100 microamp scale across the resistor. A reading of 10 to 30 microamperes should be obtained.

Both the oscillator and crystal detector can easily be check by measuring the oscillator injection current. Place a multimeter on the 100 microamp scale at the terminal on the underside of the chassis (white lead from UHF tuner). A reading of 5 to 40 microamperes should be obtained if both the oscillator and crystal are functioning normally.

If soldering iron servicing, crystal detector or mechanical parts replacement is necessary, the picture tube must be removed. Removing the picture tube makes the majority of the UHF tuner components within easy reach and most of the parts can be serviced. The tuner should not be removed from the chassis.

CAUTION: When attempting to service the tuner, do not move or rearrange any components or mechanical parts as a change in the distributed capacity may result and offset the alignment. When replacing a component be sure to obtain the same lead lengths and replace it in the same physical position.

CRYSTAL DETECTOR: If replacement of the CK-710 crystal detector is necessary, the picture tube must be removed along with the crystal cover. The crystal is soldered in place and should be carefully resoldered after replacement. Overheating may damage the crystal. To dissipate the heat, grasp each crystal lead with a pliers when soldering into place.

DRIVE CORD STRINGING

If for any reason the drive cord of either the RF or oscillator cavities need replacement, the exact cord and length are recommended. The cord used is of a special material which is not affected by temperature or moisture. Refer to the parts list for the correct replacement. The oscillator drive assembly consists of four (4) separate drive cords each locked to the oscillator drive pulley (Fig. 2). Each RF drive assembly consists of two separate drive cords which are locked to the RF cavity drive pulley (Fig. 3). If the drive cord requires replacement, the picture tube should be removed along with the cavity cover. Follow the diagram and replace the cord as indicated. After replacement follow the instruction for realignment on page 1.

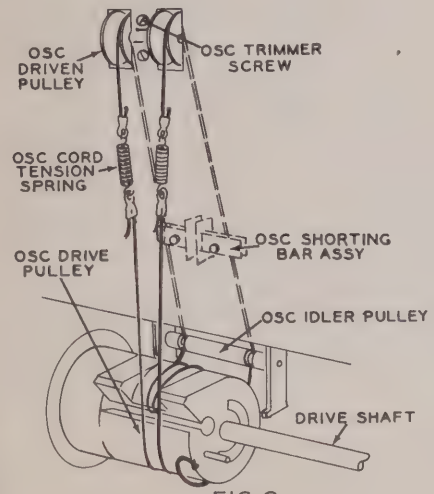


FIG 2

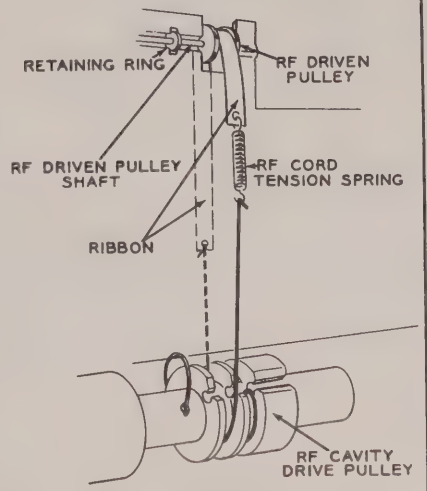
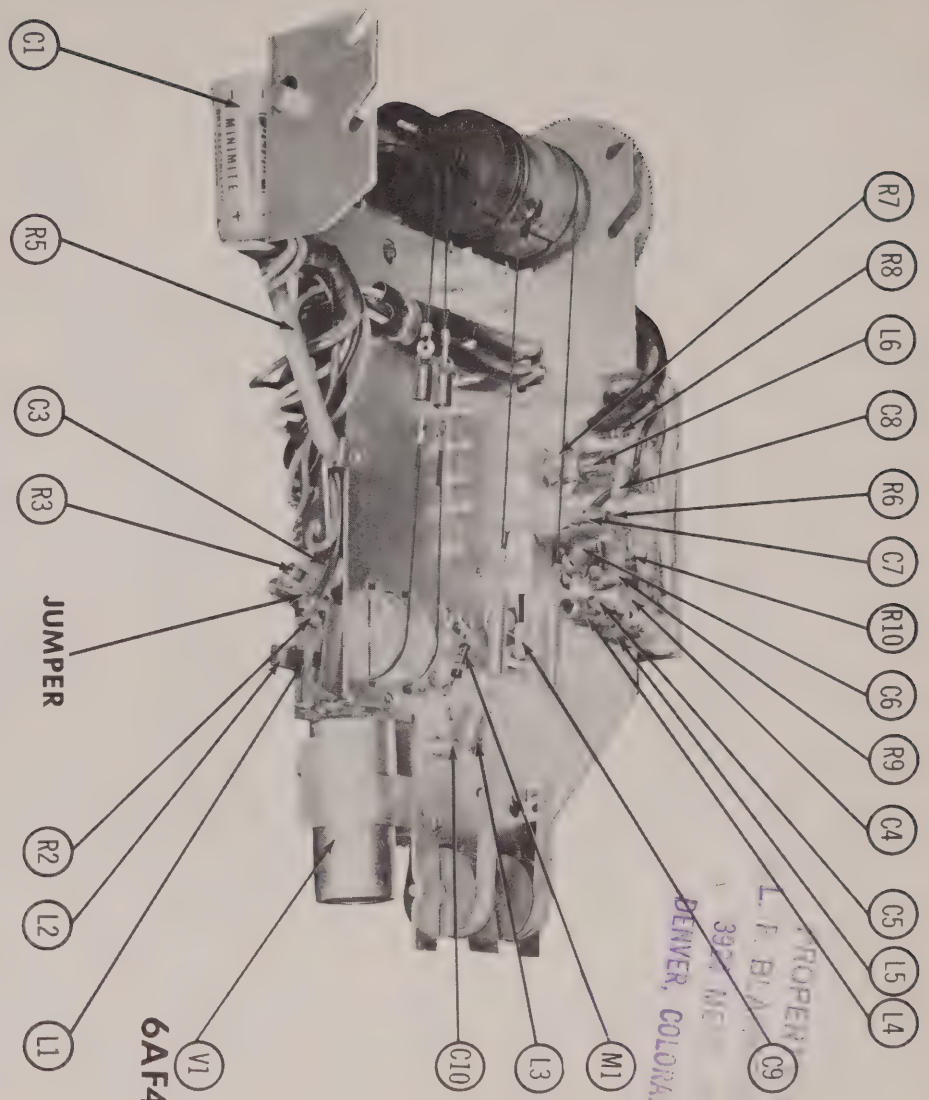


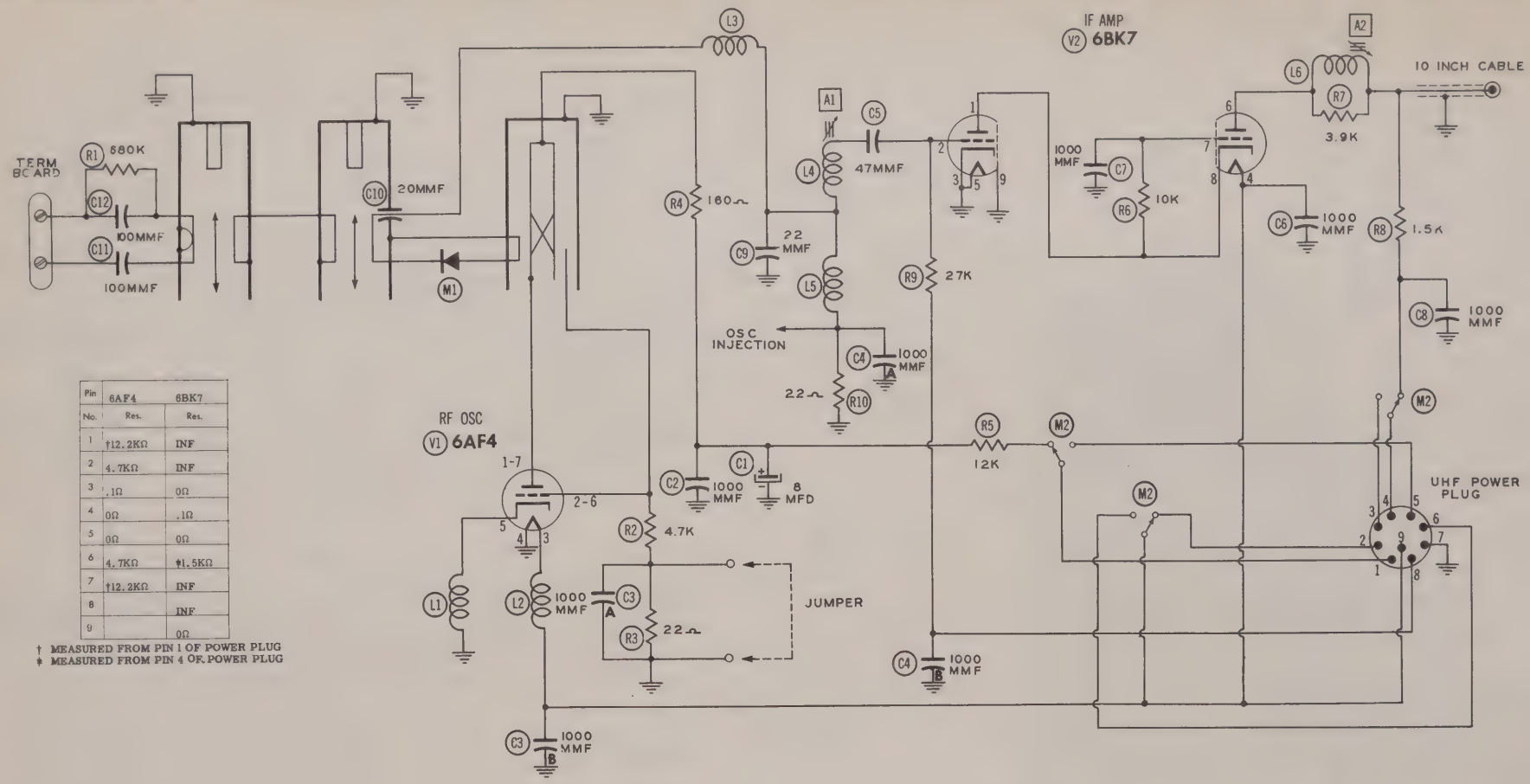
FIG 3

CHASSIS—BOTTOM VIEW



SET 221 FOLDER 12

TRUETONE MODEL 3D6000



Pin No.	6AF4 Res.	6BK7 Res.
1	†12.2KΩ	INF
2	4.7KΩ	INF
3	.1Ω	0Ω
4	0Ω	.1Ω
5	0Ω	0Ω
6	4.7KΩ	‡1.5KΩ
7	†12.2KΩ	INF
8		INF
9		0Ω

† MEASURED FROM PIN 1 OF POWER PLUG
‡ MEASURED FROM PIN 4 OF POWER PLUG

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

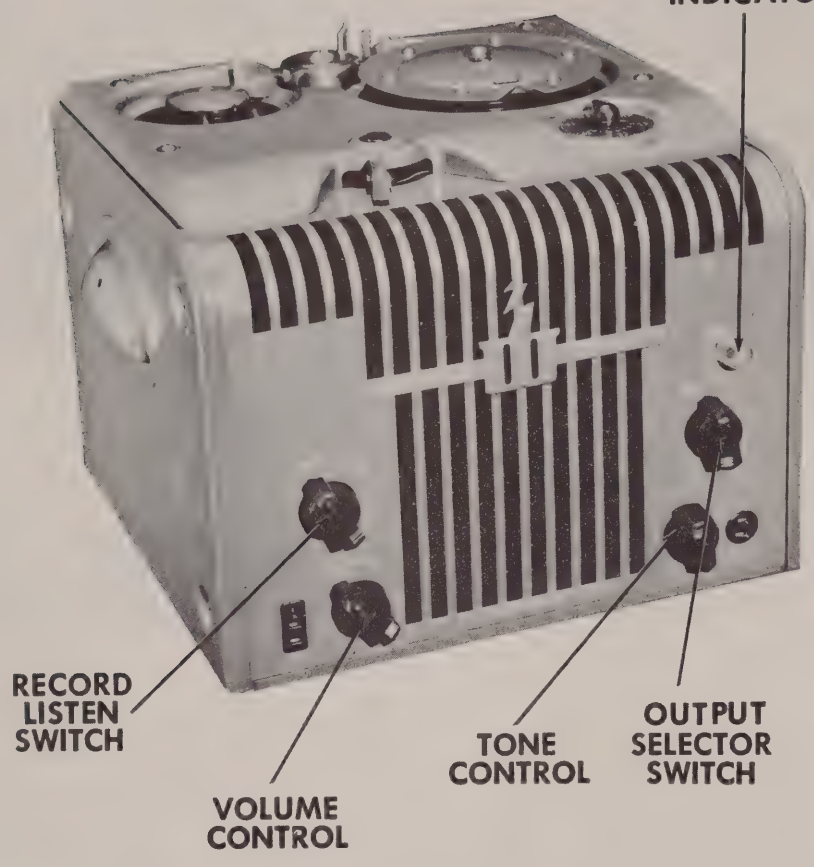
© Howard W. Sams & Co., Inc. 1953

221-12

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
L. F. BLANKENSHIP
3924 [illegible] ST.
DENVER, COLORADO

WEBCOR
MODEL 181-1R



WEBCOR
MODEL 181-1R

TRADE NAME	Webcor Model 181-1R
MANUFACTURER	Webster Chicago, 5610 Bloomingdale Ave., Chicago 39, Illinois
TYPE SET	AC Operated Wire Recorder and Amplifier
TUBES (Four)	Types 6SJ7 Mic Pre Amp., 6J5 AF Amp., 6V6GT Audio Output, 6X5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .3 Amp @ 117 Volts AC

FOR SERVICE INFORMATION ON THE MECHANICAL PORTION OF THIS UNIT-SEE PHOTOFACT SET 156-FOLDER 13 OR RECORD CHANGER MANUAL CM-4.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		WEBCOR PART No.	STANDARD REPLACEMENT		
V1	Mic Pre Amp	6SJ7	6SJ7	8N	
V2	AF Amplifier	6J5	6J5	6Q	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■25	450		AFH3-33		CO25		FP376.1	R1359	
B	▲15	350								
C2A	▲15	250		AFH3-119		BO29		FP345.5	TVL-3675	
B	■15	350				BR502A				
C	40	25								
C3	10	25		PRS25/10		BR102A		TC22	TVA-1204	
C4	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C5	.0001	1000						TP401	6TM-T1	
C6	.01	100								
C7	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C8	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C9	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C10	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C11	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C12	.0022	600		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C13	.0022	600		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C14	.0022	600		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C15	.5	400		P488-5		PTE4P5		PT405	4TM-P5	
C16	.015	600				PJ6S15			6TM-S15	
C17	.015	600				PJ6S15			6TM-S15	

CONTROLS

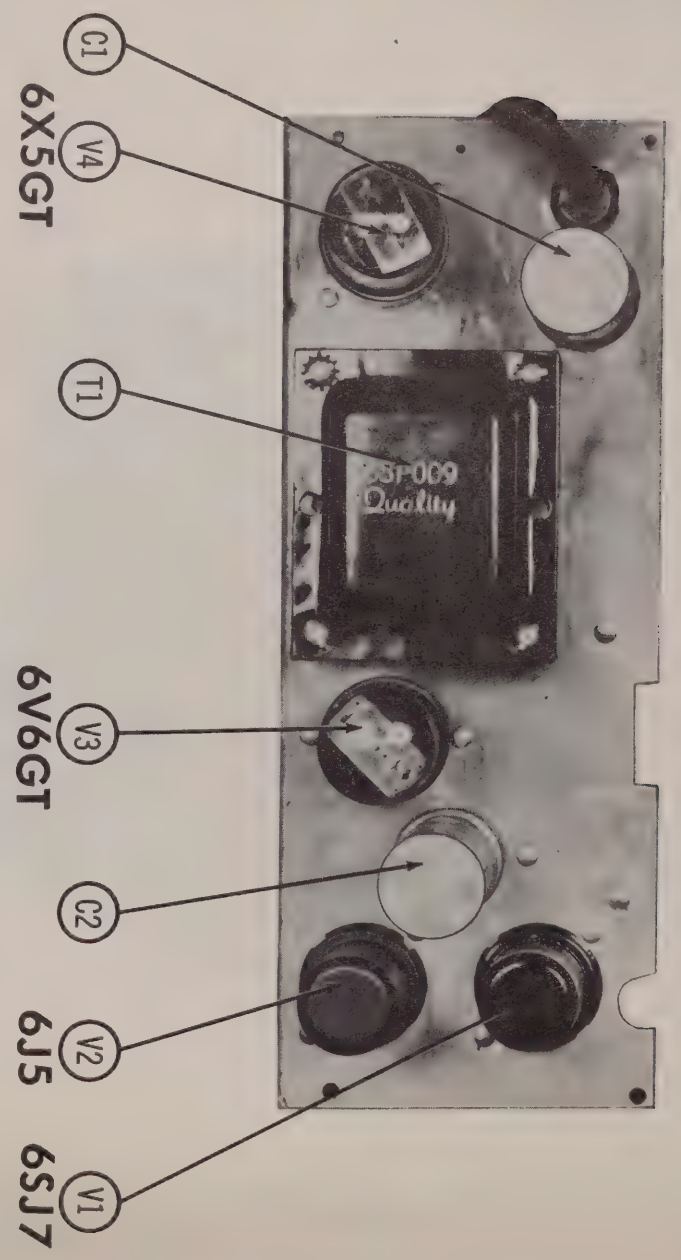
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	31P035	Q13-137	AG-63-Z	BSK-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	31P049	Q11-133	AG-58-S	AB-59	SU-50	Indicator Level
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	50KΩ	½	31P036	Q13-123	AG-46-Z	AB-32	U-34	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R4	100KΩ	½		BTS-100K	
R5	4.7Meg	½		BTS-4.7Meg	
R6	1 Meg	½		BTS-1 Meg	
R7	150KΩ	½		BTS-150K	
R8	100KΩ	½		BTS-100K	
R9	1000Ω	½		BTS-1000	
R10	39KΩ	½		BTS-39K	
R11	820Ω	½		BTS-820	
R12	220KΩ	½		BTS-220K	
R13	270KΩ	½		BTS-270K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R14	470KΩ	½		BTS-470K	
R15	470KΩ	½		BTS-470K	
R16	68KΩ	½		BTS-68K	
R17	820Ω	½		BTS-820	
R18	22KΩ	½		BTS-22K	
R19	270Ω	1		BTA-270	
R20	1000Ω	5		1 3/4A-1000	
R21	3.3Ω	2			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	WEBCOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @.30A	560VCT .042ADC	6.3VAC 1.6A		68P009	PM-8407 ①	P-3048	R-7B	

① Tape extra 5 volt winding

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		WEBCOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5KΩ	3.4Ω	357Ω	1.1Ω	67P011	A-3877 ①	A-2930 ①	RO-9 ①	S-3X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.4Ω	76P016	ST-105 Mod. P5-X	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	WEBCOR PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Osc. Coil	.1Ω	12Ω	65P024				Sec. tapped @ .8Ω

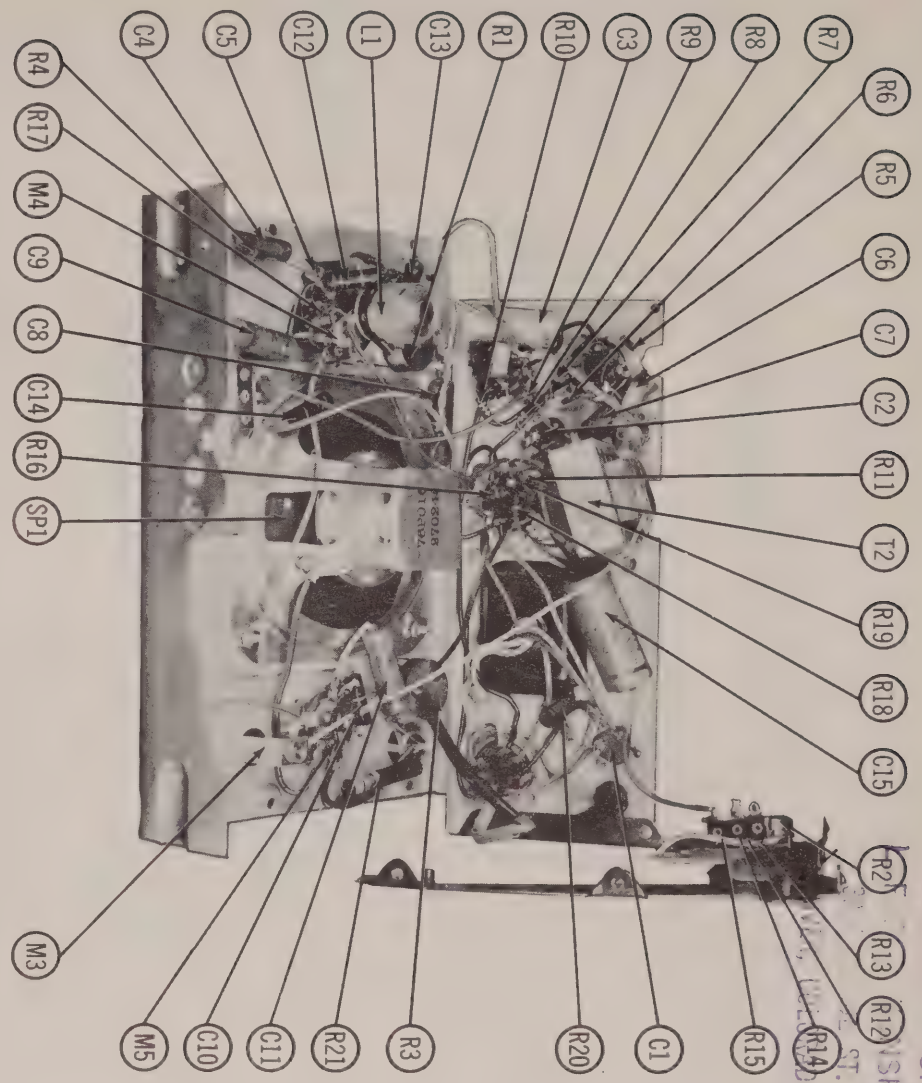
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			WEBCOR PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1A	3AG	1A @ 250V			312001 (3AG-1Amp)		AGC-1	
B	3AG	1A @ 250V			312001 (3AG-1Amp.)		AGC-1	

MISCELLANEOUS

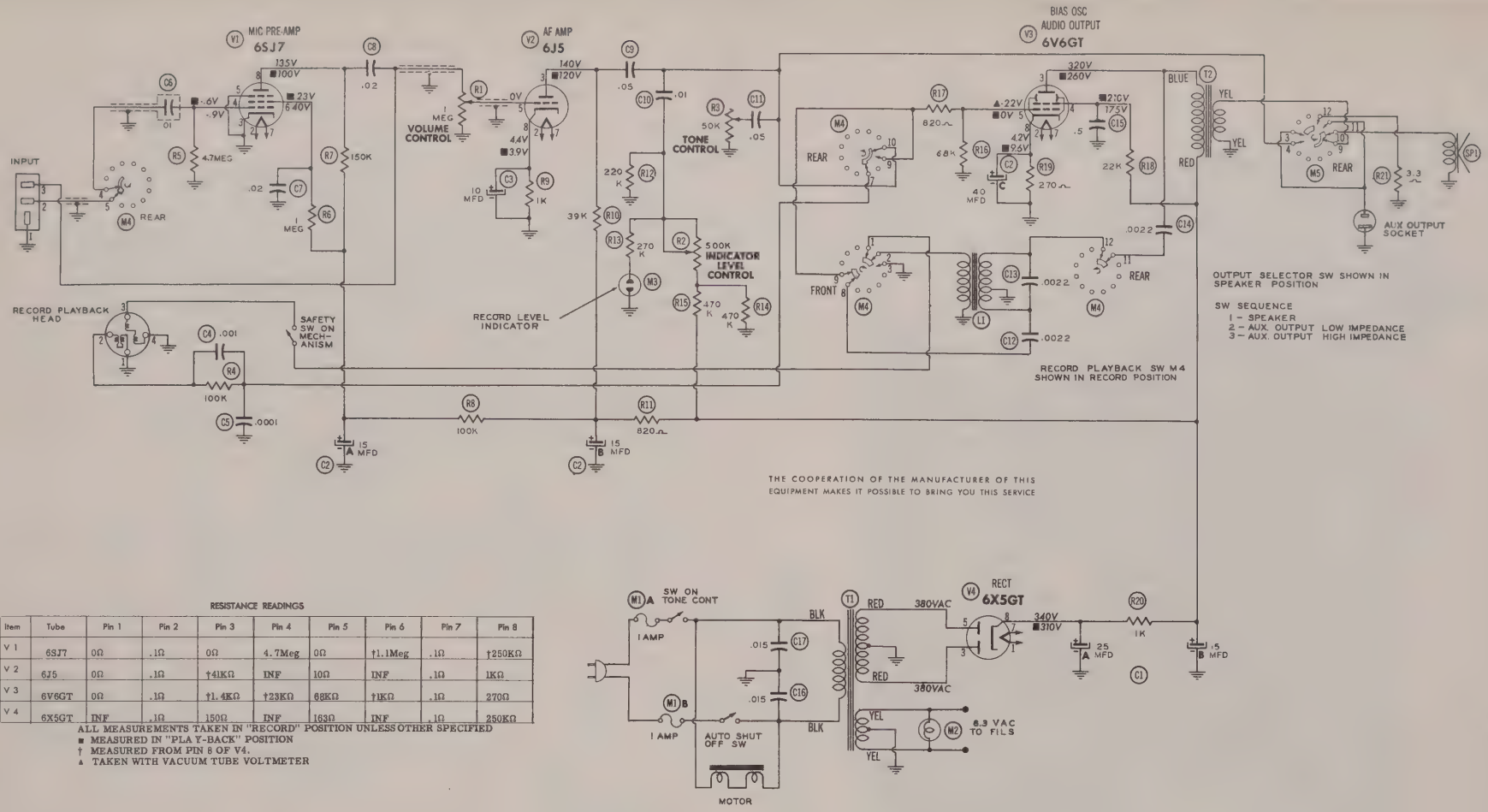
ITEM No.	PART NAME	WEBCOR PART No.	NOTES
M2	Pilot Light		Type #51
M3	Neon Bulb		Record Level Indicator (Type NE51)
M4	Switch	32P040	Record-Playback Selector
M5	Switch	32P041	Output Selector

CHASSIS—BOTTOM VIEW



PROPERTY OF

WEBCOR MODEL 181-R



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0Ω	.1Ω	0Ω	4.7Meg	0Ω	†1.1Meg	.1Ω	†250KΩ
V 2	6J5	0Ω	.1Ω	†41KΩ	INF	10Ω	INF	.1Ω	1KΩ
V 3	6V6GT	0Ω	.1Ω	†1.4KΩ	†23KΩ	68KΩ	†1KΩ	.1Ω	270Ω
V 4	6X5GT	INF	.1Ω	150Ω	INF	163Ω	INF	.1Ω	250KΩ

ALL MEASUREMENTS TAKEN IN "RECORD" POSITION UNLESS OTHER SPECIFIED
■ MEASURED IN "PLAY-BACK" POSITION
† MEASURED FROM PIN 8 OF V4.
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1953

221-13

1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ZENITH
MODELS L403F, G, R, Y (Ch. 4L41)

ZENITH
MODELS L403F, G, R, Y (Ch. 4L41)

TRADE NAME	Zenith Models L403F, G, R, Y (Ch. 4L41)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output,
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 1½ Volts "A" Supply & 67½ Volts "B" Supply .11 Amp. @ 117 Volts AC (or) 250MA @ 1½ Volts DC & 11MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer turn tuning capacitor fully closed and set pointer straight up, pointing to low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400%mod.)	600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	"

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ZENITH
MODEL L403F (Ch. 4L41)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■80	150							R1282	
B	▲20	150	22-2446							
C	200	10								
C2	.022	400	22-2072	P488-022	DD-203	PTE4S22		PT4122	4TM-S22	
C3	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	UC-5240	5HK-D4	
C4	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C5	.0022	400	22-2161	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C6	.047	200	22-1778	P288-047	DF-503	PJ2S5		PT4147	2TM-S47	
C7	.1	200	22-17777	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C8	120		22-5	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C9	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C10A	100		SI100			TM5T1		UC-531		
B	5000		♦105-31	BPD-005	♦PC-91	TM5D5	♦1407-03	DC-525	♦103C3	
C	5000			BPD-005		TM5D5		DC-525		
C11	.01	400	22-1846	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C12	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C13	.047	400	22-1775	P488-047		PTE4S47		PT4147	4TM-S47	

♦ Items C10A, C10B, C10C, R9A, R9B, R9C are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	63-3168	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

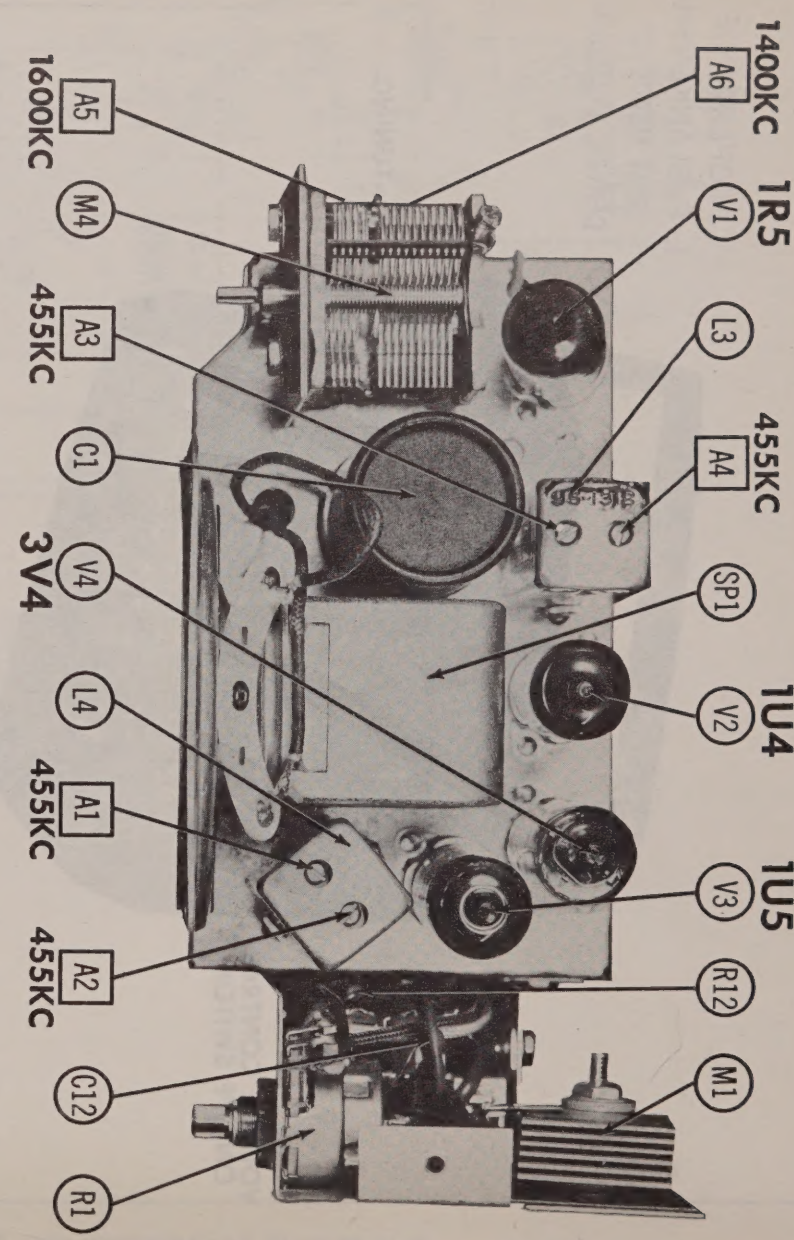
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R2	100KΩ	½	63-1870	BTS-100K	
R3	1000Ω	½	63-1786	BTS-1000	
R4	3900Ω	½	63-1810	BTS-3900	
R5	1Meg	½	63-1912	BTS-1Meg	
R6	1000Ω	½	63-1785	BTS-1000	
R7	4.7Meg	½	63-1940	BTS-4.7Meg	
R8	4.7Meg	½	63-1940	BTS-4.7Meg	
R9A	4.7Meg	½	♦105-31	BTS-4.7Meg	
B	1Meg	½		BTS-1Meg	
C	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R10	300Ω	½	63-1762		
R11	470Ω	½	63-1771	BTS-470	
R12	470Ω	½	63-1771	BTS-470	
R13	270Ω	½	63-1761	BTS-270	
R14	180Ω	4	63-2821		
R15	1750Ω	5	63-2819	1 3/4A-1750	
R16	1000Ω	½	63-1785	BTS-1000	

♦ Items R9A, R9B, R9C, C10A, C10A, C10B, C10C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	9.7KΩ	3.2Ω	546Ω	.49Ω	95-1332	A-3329			S-11X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.2Ω	49-730	35J4	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1Ω		S-19584				
L2	Osc. Coil	1.8Ω	8Ω	S-19660				
L3	Input IF	18Ω	18Ω	95-1330				
L4	Output IF	17Ω	17Ω	95-1331				

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	ZENITH PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.062ADC	212-5	NB5	5M4	1003A	6S75	75

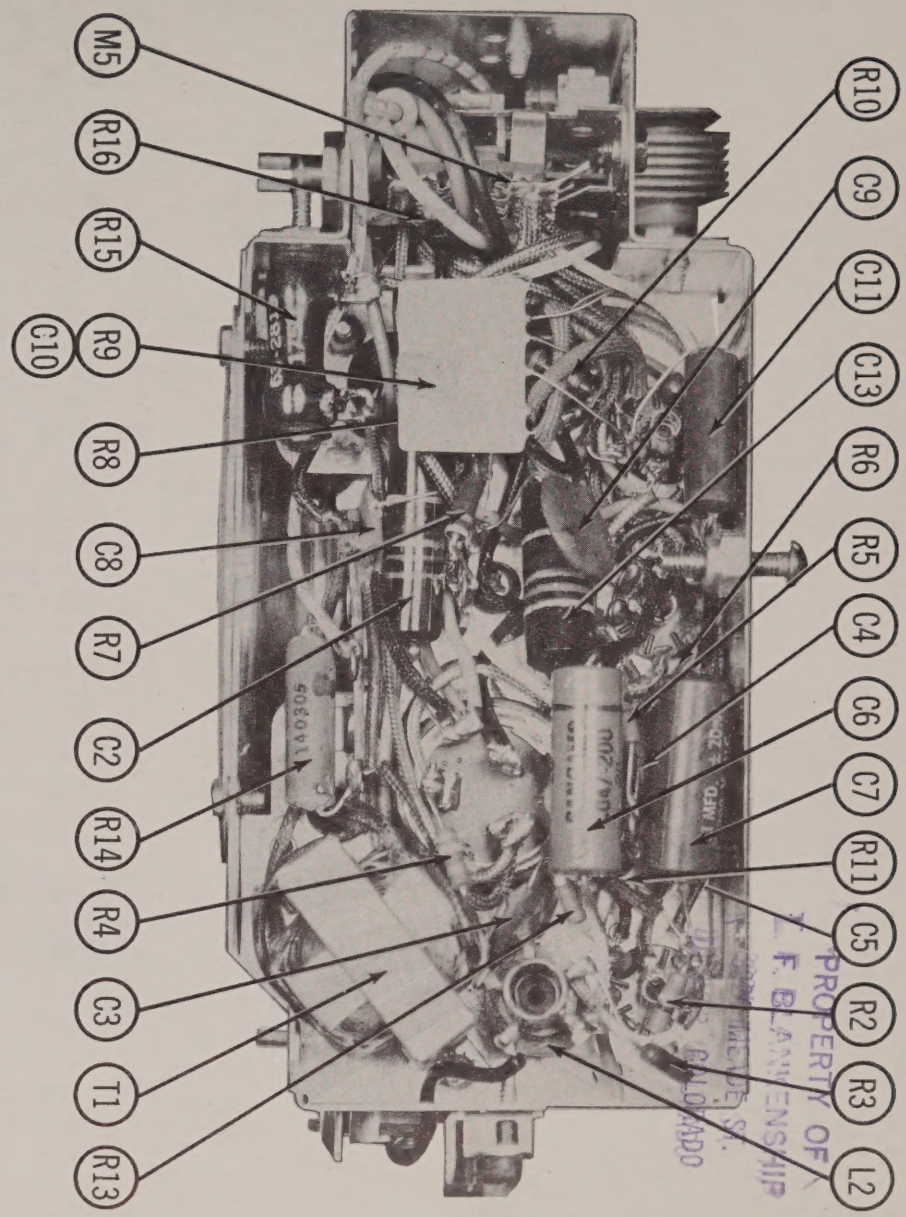
BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V	Z5	964			2IR			2 Used (In parallel)
M3	67.5V	Z67		467			P45		

MISCELLANEOUS

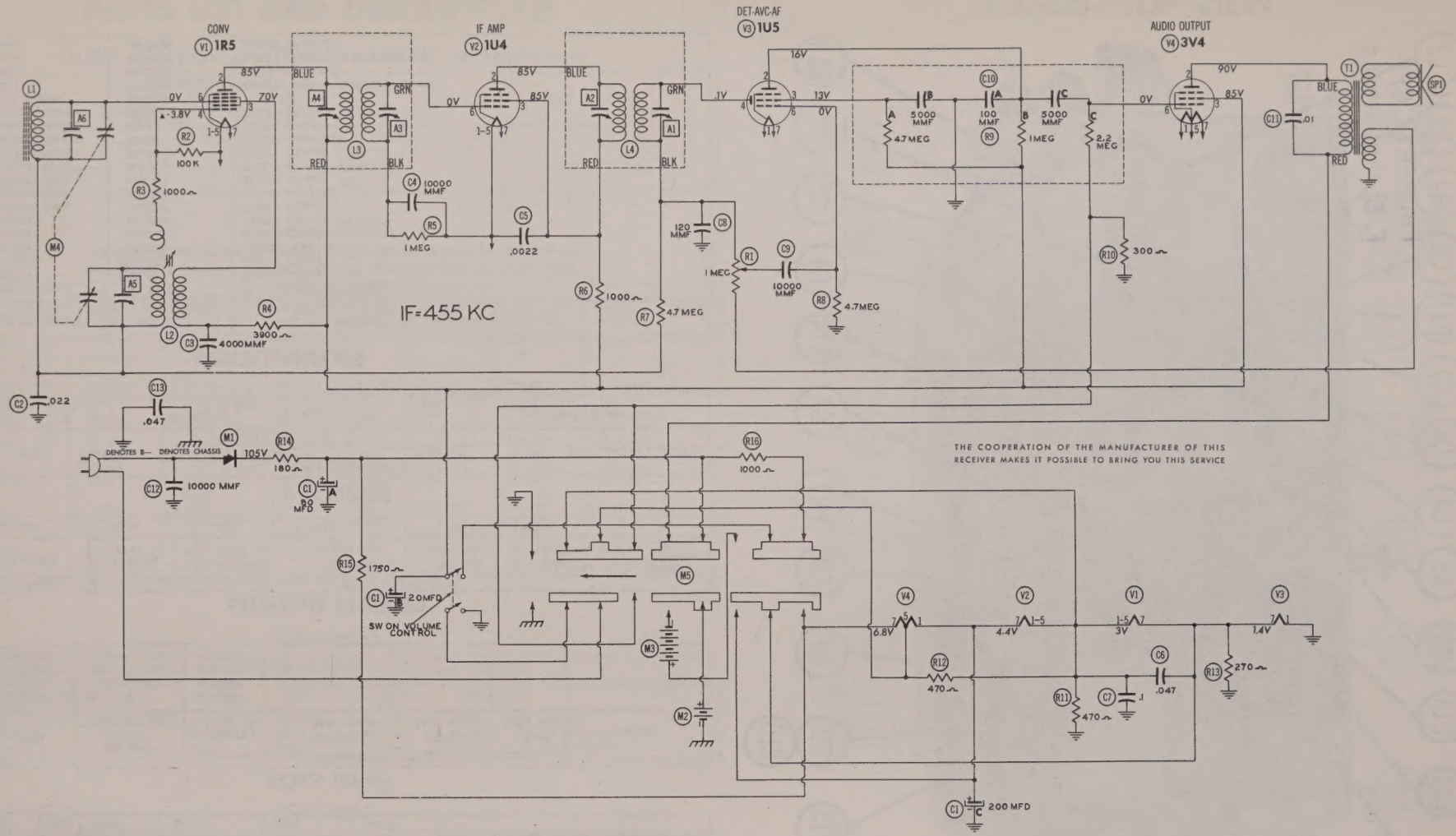
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M4	Tuning Cap.	22-2445	14-270MMF, 10-90MMF
M5	Switch	85-454	Power Change-over
	Cabinet	14-1522	L403Y (Black)
	Cabinet	14-1523	L403R (Maroon)
	Cabinet	14-1524	L403G (Gray)
	Cabinet	14-1525	L403F (Green)
	Cabinet Back	14-1527	L403Y (Black)
	Cabinet Back	14-1528	L403R (Maroon)
	Cabinet Back	14-1529	L403G (Gray)
	Cabinet Back	14-1530	L403F (Green)
	Cabinet Handle	36-68	L403Y (Black)
	Cabinet Handle	36-69	L403R (Maroon)
	Cabinet Handle	36-70	L403G (Gray)
	Cabinet Handle	36-71	L403F (Green)
	Dial Pointer	59-288	
	Knob	46-1084	L403Y, L403R, L403F (Volume)
	Knob	46-1085	L403G (Volume)
	Knob	46-1089	L403Y, L403R, L403F (Tuning)
	Knob	46-1090	L403G (Tuning)

CHASSIS—BOTTOM VIEW



PROPERTY OF
F. BLANKENSHIP

ZENITH
MODEL L403F (Ch. 4L41)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†1. 2KΩ	†5. 1KΩ	100KΩ	*	5. 7 Meg.	*
V 2	1U4	*	†2. 2KΩ	†2. 2KΩ	*	*	1 Meg.	*
V 3	1U5	*	†1Meg	†4. 7Meg	1 Meg.	*	4. 7 Meg.	*
V 4	3V4	*	†726Ω	†1. 2KΩ	2KΩ	*	2. 2 Meg.	*

VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN IN AC-DC POSITION.
† MEASURED FROM OUTPUT OF M1 (SELENIUM RECTIFIER)
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1953

221-14

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.